TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

OCTOBER 15, 1960
Price 50c

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USITA—KEYSTONE OF THE INDEPENDENTS

The Independent Telephone Industry, by Clyde S. Bailey

COMMUNICATIONS NETWORK PLANNING

Planning Central Office Locations, by Carl Hanenburg

Celebrating

OUR

YEAR

For fifty years of progress, we gratefully acknowledge the role played by our customers in our growth and development. Their sustained support and approval have given us a vote of confidence year after year, which has inspired our efforts toward the achievement of the highest standards of service. In appreciation, we rededicate ourselves to continuing the highest standards of service during future years as the telephone industry continues to progress.

1910 · 1960

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TELEPHONE ENGINEER & MANAGEMENT

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TELEPHONE ENGINEER & MANAGEMENT

the telephone industry magazine

VOL. 64 NO. 20 OCT. 15, 1960

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THE TE&M FRONT COVER

HELPING HEAR HEAVENLY SOUNDS — A pair of comely secretaries are "served up" on a 40-foot parabolic "dish" antenna at International Telephone & Telegraph Laboratories, Nutley, N. J. When mounted, the antenna and associated electronic equipment will enable IT&T scientists to "listen in" on radio signals reflected in space by the moon or by man-made satellites. Pretty posers are JANET PULICHINE of Fairlawn, N. J., and JUDY ROONEY of Clifton, N. J.

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AUTOMATIC ELECTRIC HAS THE RIGHT SUPPLIES FOR YOUR OPERATIONS!

Buying the right supplies is a real problem for independent telephone companies. Some supplies give plenty of headaches soon after delivery. Others give years and years of trouble-free performance. How can you tell the difference? How can you be sure that the brand you buy will deliver all the quality you need?

One sure way to insure quality is to rely on a famous brand name that stands squarely behind its product. Another way is to buy from a dependable supplier. You use both methods when you buy FAMOUS BRANDS from AUTOMATIC ELECTRIC.

Automatic's supply service provides a complete line of equipment for you to choose from . . . Pole Line Hardware . . . Cable & Wire . . . Large & Small Tools . . . Protective Equipment and many other items. And, Automatic really shines when it comes to delivery. In most cases, your order is picked from stock and shipped the same day.

Shown here is one of our many supply items — it should fit nicely into YOUR operations.

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Executone®

NEW SCHOOL-TO-HOME SYSTE FOR SHUT-IN STUDENTS!

Here's how to provide a real service to your com munity—and build strong customer relations a well. It's the Executone School-to-Home System Executone gives your company and the schoo favorable publicity at no cost. It is estimate that one out of every 300 school age children i hospitalized or shut-in. Through this unique tele phone system, the shut-in child can now be in structed at home—with a very simple hookup A direct telephone line makes two-way commu nication possible between the home (or hospital

Go School by Telephone!

and the school classroom.

Executone School-to-Home equipment consists of a compact amplifier and microphone-speaker for the student, an amplifier unit for the school and a portable classroom station.

You can supply the Executone School-to-Home System to your community's schools, at modest cost. For complete information, call your Automatic representative or your nearest A. E. Sales Corporation warehouse.

AUTOMATIC ELECTRIC GENERAL SYSTEM

Subsidiary of

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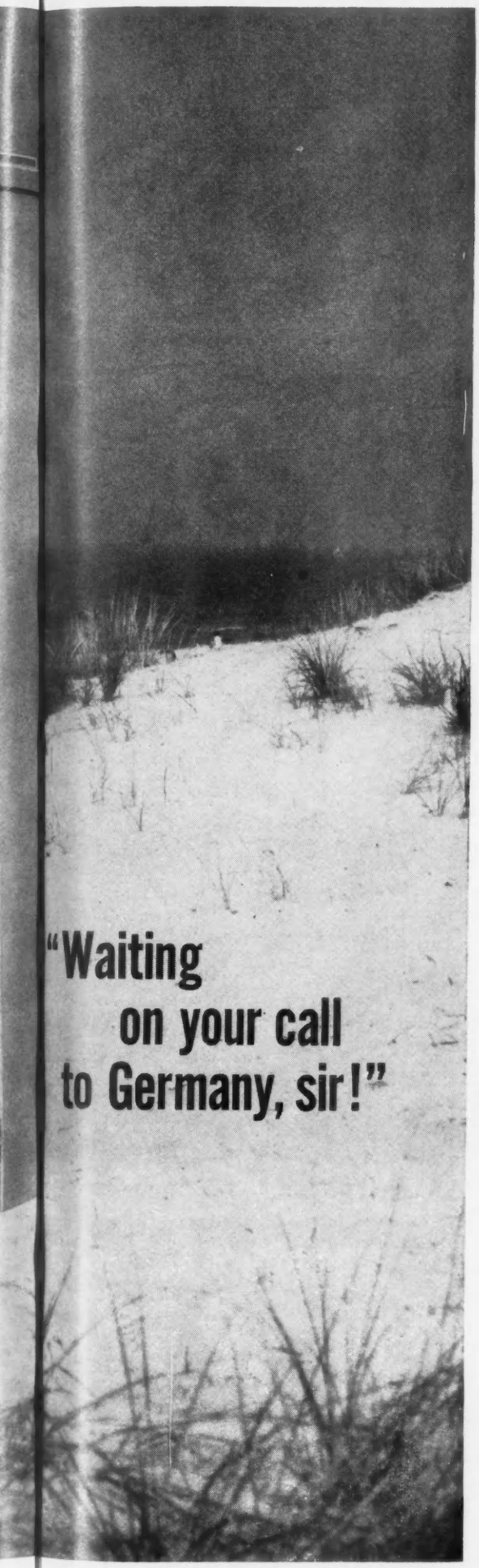


No—Portage, Indiana is not on the seacoast, but on a small stretch of Indiana's inland coast, bordering Lake Michigan. Yet, it's 800 miles closer to Hamburg, Germany, than New Orleans, La., is! And thereby hangs our tale.

Except for sea gulls and great blue heron, beavers and an occasional Boy Scout, the beach near Portage, Ind., is sparsely populated—right now. But not for long. For this is the site of a town-to-be . . . a harbor for ocean-going vessels . . . a steel production center that is expected to employ more than 50,000 people!

General Telephone Company of Indiana already has completed plans for serving Portage Township . . . will spend more than $2 million in the proposed construction and conversion program. And, it is expected, some 3,000 telephone customers will be connected to the new facilities at conversion time.

A significant number of the new facilities will be Alcoa® Aluminum booths. Because Alcoa booths serve so many so well in other locations, GEN TEL decided they will earn high revenue—with low maintenance costs—here, too. Because aluminum defies corrosion, the moist lake air and buffeting, sand-laden winds won't hurt it a bit. And because Alcoa booths are colorful, well lighted and sturdy, they attract users! Easily maintained, dirt and grime may be washed off with plain water . . . and aluminum never needs painting!

For more information about Alcoa Aluminum outdoor booths . . . and the new Alcoa compact aluminum booth, write Aluminum Company of America, 1721-X Alcoa Building, Pittsburgh 19, Pa.

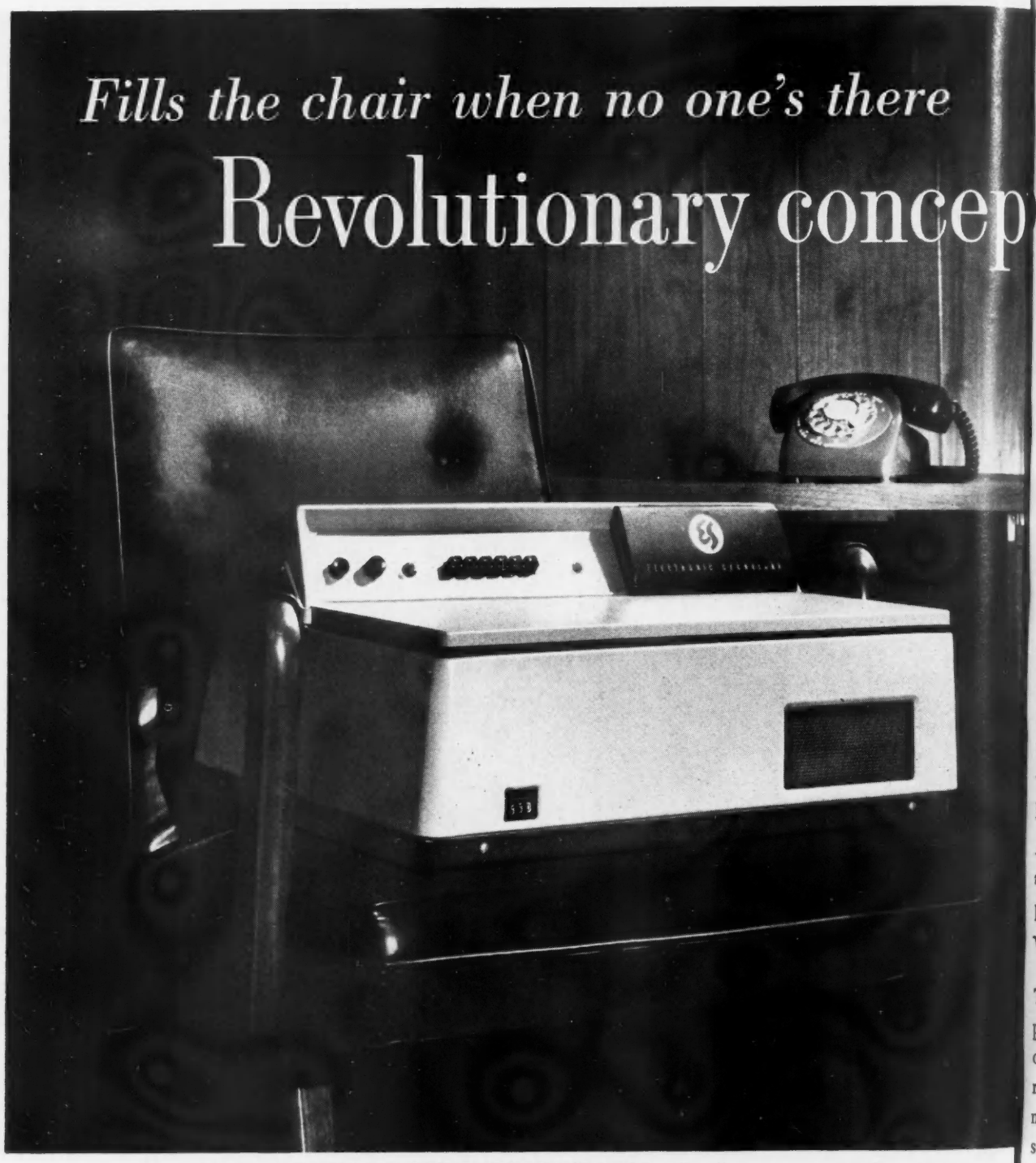
"We chose Alcoa booths because they're light in weight yet sturdy," says Mr. P. E. Platt (left), Northwestern Division manager for GEN TEL. "They require a minimum of maintenance, are well lighted, colorful—and really attract users," adds Mr. J. D. Canfield, GEN TEL's district commercial manager.

ALCOA ALUMINUM

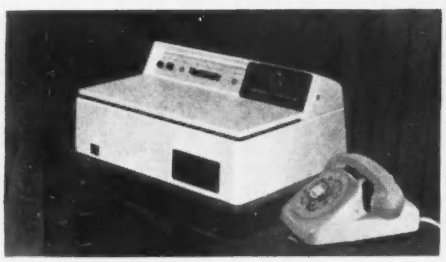
ALUMINUM COMPANY OF AMERICA

Fills the chair when no one's there

Revolutionary concep

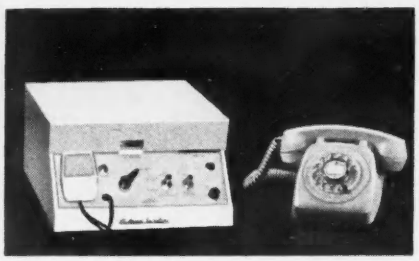


New line of ELECTRONIC SECRETARY telephone answering sets



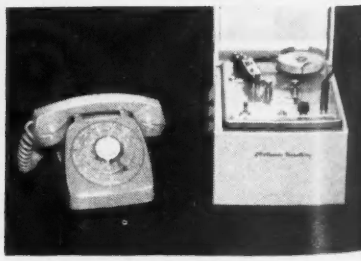
LP(Long Play) model

The de luxe model that "does everything." Answers the phone automatically with message prerecorded by customer—(easily "erased" and changed)—records incoming messages, plays them back when customer returns. Takes any number of incoming messages up to 2-hour capacity. For service companies and individuals, stores, offices, plants and specialized uses in many other types of business.



SP (Short Play) model

This performs the same answering function as the LP model but has a more limited capacity. Answers the phone, gives message to caller, records up to twelve 13-second incoming messages. Compact, about typewriter size. Specially designed for the small service outfit or business. Low monthly rental greatly broadens the market.



AO (Answer Only) model

Answers phone with prerecorded announcem does not record incoming calls. Has micropl tape recorder. Used by all sorts of organiz deliver informative announcements up to 3 Theatres tell what's playing. Fuel suppliers a leave numbers to call for emergency service Advertisers sponsor weather reports, stock Churches give inspirational messages.

f telephone service now made available to meet every customer's needs

Traditionally, telephone service has been based on this simple proposition: when the phone rings, someone must be there to answer it. Then came a major breakthrough—telephone answering when no one is there—with fully automatic ELECTRONIC SECRETARY® phone answering sets.

And now, for the first time, a complete line of these remarkable devices is available to help expand your profits into entirely new areas.

Virtually unlimited market

Today, ELECTRONC SECRETARY sets are being produced in three basic models. No matter what kind of business or service organizations your customers run—no matter how large or small their companies may be—there is an ELECTRONIC SECRETARY set to provide just the kind of *fully automated answering they need.*

Just think how many of your customers are realtors, contractors, doctors, radio-TV repairmen—men in service businesses or professions who cannot afford to miss phone calls. Now you can offer them a practical device that answers the phone automatically—24 hours a day, 7 days a week—all for a modest monthly rental.

Think of all the larger business firms that can save time and money by having sales orders and reports phoned into an ELECTRONIC SECRETARY set. Finally, consider the many organizations who can benefit from "Answer Only" models—which make information announcements. They all add up to massive new markets for you.

National advertising now being readied

A powerful advertising program for the ELECTRONIC SECRETARY line means profitable business if you're ready for it. If you're interested in new revenue, we suggest you call or write either of the distributors listed below.

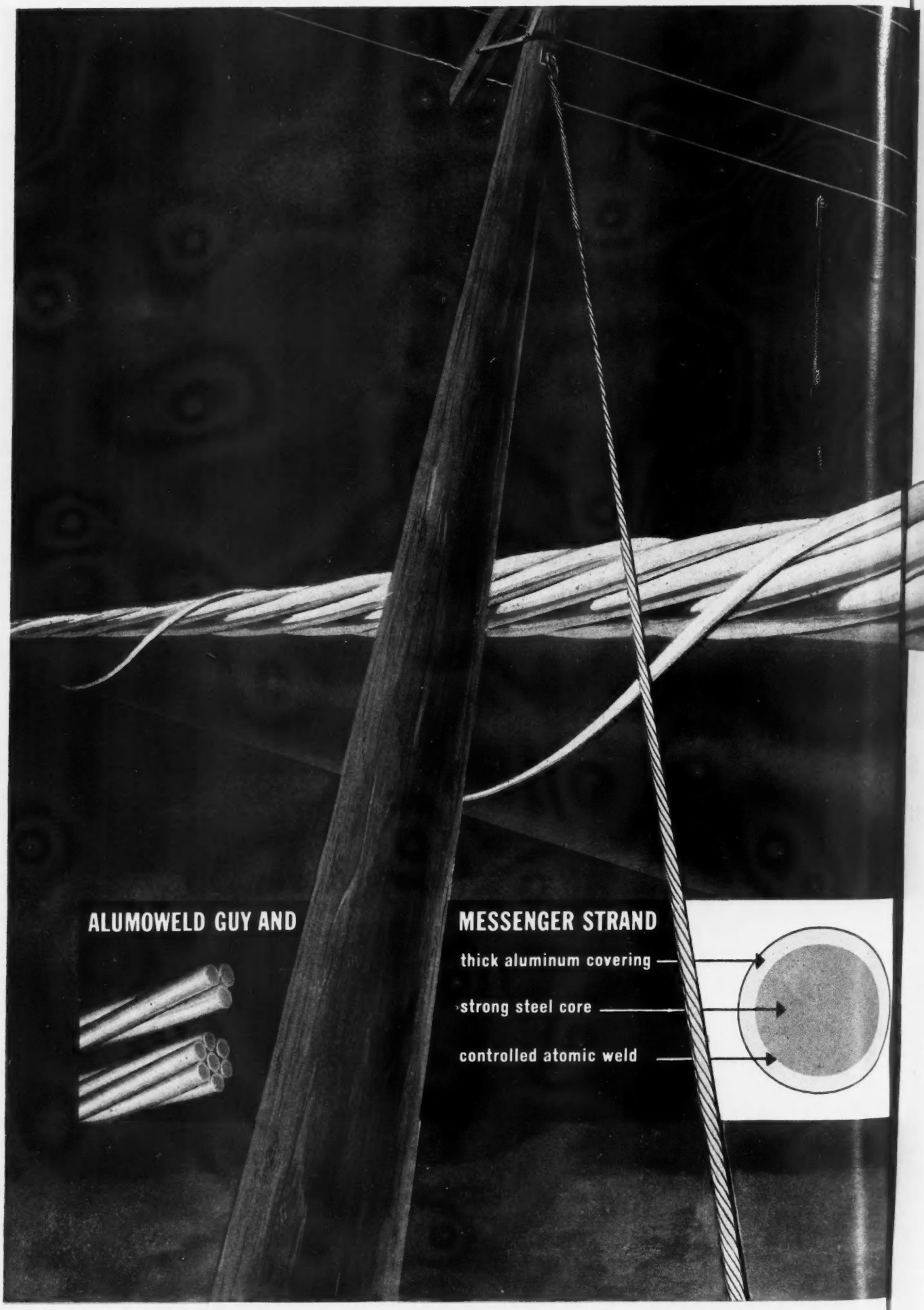
Electronic Secretary Industries, Inc., Subsidiary of GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

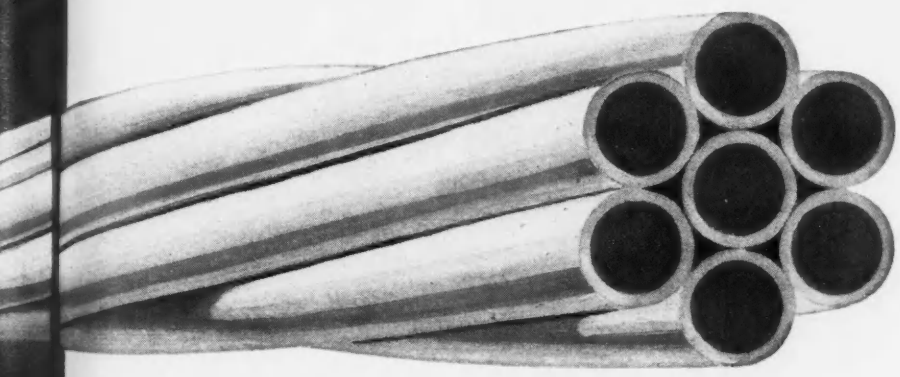
distributed by

AUTOMATIC ELECTRIC SALES CORPORATION
400 North Wolf Road Northlake, Illinois

LEICH SALES CORPORATION
427 West Randolph St., Chicago 6, Illinois


ALUMOWELD GUY AND
MESSENGER STRAND
thick aluminum covering
strong steel core
controlled atomic weld

Are you taking advantage of ALUMOWELD STRAND for guys and messengers?



HIGH STRENGTH-TO-WEIGHT RATIO . . . PERMANENCE . . . LOW COST . . . AVAILABILITY

You get the benefits of high-strength steel and pure aluminum—at low initial cost—when you use Alumoweld for your guys and messengers.

Since Alumoweld will not rust or corrode, its high strength is permanent. Costly maintenance is eliminated because Alumoweld Guys and Messengers stay up for the life of the installations they support.

Alumoweld is the only strand made with wires having a *thick* aluminum covering—25% by area. And the aluminum cannot crack, flake or peel . . . it is interlocked with the steel core by a ductile weld that is permanent under all operating conditions.

The rugged strength of Alumoweld is the same as steel, but Alumoweld will last far longer. In fact, Alumoweld has the same long life and corrosion resistance as solid aluminum.

Weighing 18% less than steel of comparable diameter, Alumoweld is easier to handle. Moreover, Alumoweld has a higher strength-to-weight ratio than any other strand used on overhead lines. For messengers, you can string safer, longer spans with less sag.

It's easy to see that Alumoweld offers economies you can't afford to pass up. Put this light-weight, high-strength strand on your lines and prove it for yourself. Write today for Engineering Bulletin E.D. 3000.

SUPPLIES OF ALUMOWELD STRAND ARE AVAILABLE FOR PROMPT SHIPMENT FROM OUR WAREHOUSES IN NEW YORK, CHICAGO, PITTSBURGH AND MEMPHIS.

ALUMOWELD®

COPPERWELD STEEL COMPANY
WIRE AND CABLE DIVISION
Glassport, Pa.

For Export: COPPERWELD STEEL INTERNATIONAL COMPANY, New York

a FIRST look . . .

New Airtronics MULTI-PURPOSE, PORTABLE test hybrid se

CHECK THESE SPECIFICATIONS

120 P Repeat coil hybrid, specially adjusted for high trans-hybrid balance

128 type low pass filter

Precision 1% capacity decades on NBO

Internal switching provided for two most commonly used networks

Plug-in network arrangement, compromise net built in

Line and Net simplex leads brought out to pin jacks on front panel for special testing procedures

Convenient panel lay-out, jacks and binding posts to facilitate connection to line or external circuits

600 ohm impedance on 4 wire legs

900 ohm impedance on line, (a built-in switch permits change to 1500 ohm impedance line)

ALSO AVAILABLE

External decade capacitor and variable resistor (3 terminal) for use in locating cable opens, for compromise net, etc.

Plug-in dial to facilitate testing procedures

- **makes acceptance tests easier, faste**
- **locates cable opens accurately**
- **accommodates standard networks**

Now, a completely portable precision test hybrid for transmissi engineers and testers — ruggedly built, and packaged for ma mum convenience and flexibility. Use Airtronics new Test Hyb Set for cable and trunk acceptance tests, circuit evaluation, capac balance tests, acceptance and evaluating tests using Singing Po or Return Loss techniques, plus other specialized applications. U it, too, to locate — with *Airtronics unique new "Cable Locator"* some of those "lost" cable pairs currently unavailable for use cause of opens! This exciting innovation in telephone test equ ment determines, with new accuracy, distance to an open end — a capacity comparison method, with capacity measured to ±1

Modernize — simplify — your testing procedures with the n Airtronics Multi-purpose Portable Test Hybrid Set, Model 2 It is designed to use standard type 115H or 115AL Precision N works, available in all toll offices.

another product FIRST from

AIRTRONICS INTERNATIONAL CORPORATION

P.O. Box 8576, Fort Lauderdale, Florida (6900 West Roa

Spiraflex® CORD

BY GENERAL INSULATED WIRE WORKS, INC.*

*Licensed to manufacture under existing patents.

Telephone cord sets of proved performance backed by General Insulated's unmatched experience and know-how in the manufacture of quality telephone tinsel cordage:

Spiraflex **HANDSET CORDS** in bright colors with non-staining thermoplastic jackets in solid color extrusions matching color shade and sheen of telephone sets. Also non-staining black Neoprene jacketed cords. Both types available with or without integral moldings and terminations. Furnished in standard or extra long lengths.

STRAIGHT HANDSET AND DESK SET CORDS are available in non-staining thermoplastic constructions in matching colors and in black Neoprene.

GENERAL INSULATED WIRE WORKS, INC.

A DIVISION OF GENERAL CABLE CORPORATION
Providence 5, Rhode Island

You're never more than 24 hours av

Very seldom will you need repair or replacement service on Lenkurt carrier or microwave equipment. It is designed for easy maintenance by your own capable maintenance department—who must be your front line of defense against trouble.

In an emergency, however, your men may need help. When they do, they'll get quick and competent help from Lenkurt's Repair and Replacement Service Department.

In this little corner of its factory, Lenkurt keeps plug-in

rs away from *Lenkurt* replacement service

replacement units of every kind in stock, ready for immediate shipment. And when they are needed fast, they will be shipped *fast;* Lenkurt's experts will do everything they can to help you get your circuits back into service.

Of course, many Lenkurt users never need this service. But if *you* ever do, you will agree that Lenkurt's rapid Replacement Service is one of the most important activities in the entire Industry! It is just one of the many extras you have come to expect from Lenkurt.

When you need this service, or information about other Lenkurt products or services, call or write your nearest Automatic Electric representative, or the Director, Carrier & Radio Sales, Automatic Electric Sales Corporation, Northlake, Illinois.

AUTOMATIC ELECTRIC

Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

GENERAL SYSTEM

*QUALPETH

A NEW LINE OF QUALITY ENGINEERED TELEPHONE CABLES

Only Qualpeth telephone cables offer these new, exclusive features for the finest in transmission and performance. **Reduced cross talk** with a new oscillating face plate method of stranding pairs into units. This method insures freedom from parallelism between a pair in one unit and a pair in another unit. The end result, cross talk characteristics are greatly improved. **Polyethylene binders:** colored polyethylene binder tapes provide easy identification due to color brilliance and freedom from fraying. **Tape over shield:** an acetate tape applied over overlapped edge of smooth shield provides protection against cutting into sheath. **Sheath uniformity gauge:** tests every foot of Qualpeth cable during extrusion for thickness and concentricity of sheath. Upon customer request, Qualpeth cables will be shipped under positive pressure. Your way of checking against hidden shipment and installation damages. Qualpeth cables are available with aluminum or copper shields, in single or double sheaths, for aerial (including new Figure 8 self-supporting messenger type) duct or direct earth burial installation. Call our distributors for complete details about this outstanding line of telephone cables . . . quality-engineered to give you the finest. **Available for shipment on November 1, 1960.** General Cable Corporation, 730 Third Ave., New York 17, N.Y.

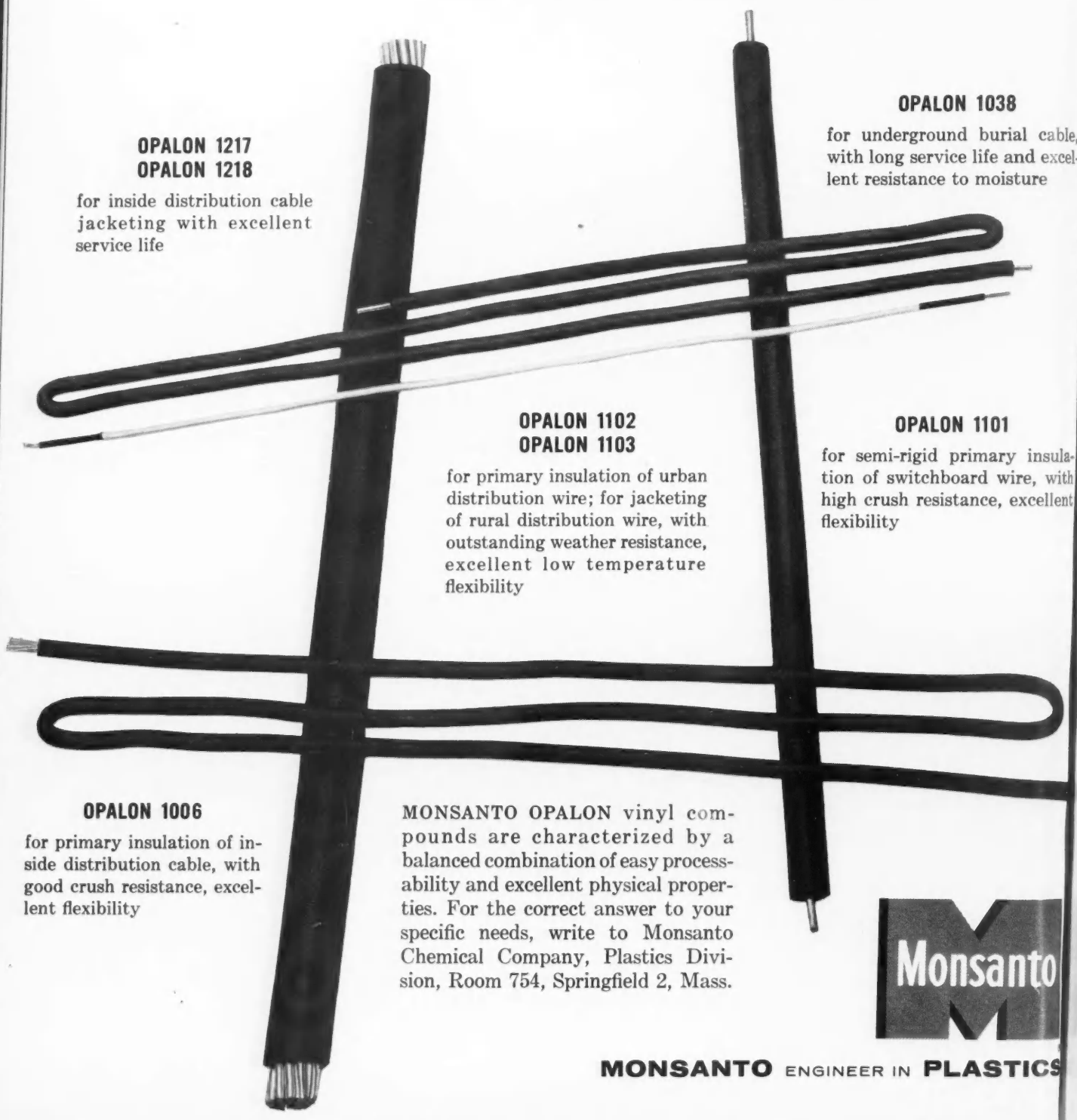
*Trademark of General Cable Corporation

Distributed by: Automatic Electric Sales Corporation, Northlake, Illinois; Leich Sales Corporation, 427 West Randolph Street, Chicago 6, Illinois.

GCC GENERAL CABLE CORPORATION

OPALON®

VINYL COMPOUNDS "JOB-ENGINEERED" TO MEET THE MOST RIGID SPECIFICATIONS IN A WIDE VARIETY OF CONSTRUCTIONS



OPALON 1217
OPALON 1218

for inside distribution cable jacketing with excellent service life

OPALON 1038

for underground burial cable, with long service life and excellent resistance to moisture

OPALON 1102
OPALON 1103

for primary insulation of urban distribution wire; for jacketing of rural distribution wire, with outstanding weather resistance, excellent low temperature flexibility

OPALON 1101

for semi-rigid primary insulation of switchboard wire, with high crush resistance, excellent flexibility

OPALON 1006

for primary insulation of inside distribution cable, with good crush resistance, excellent flexibility

MONSANTO OPALON vinyl compounds are characterized by a balanced combination of easy processability and excellent physical properties. For the correct answer to your specific needs, write to Monsanto Chemical Company, Plastics Division, Room 754, Springfield 2, Mass.

Monsanto

MONSANTO ENGINEER IN **PLASTICS**

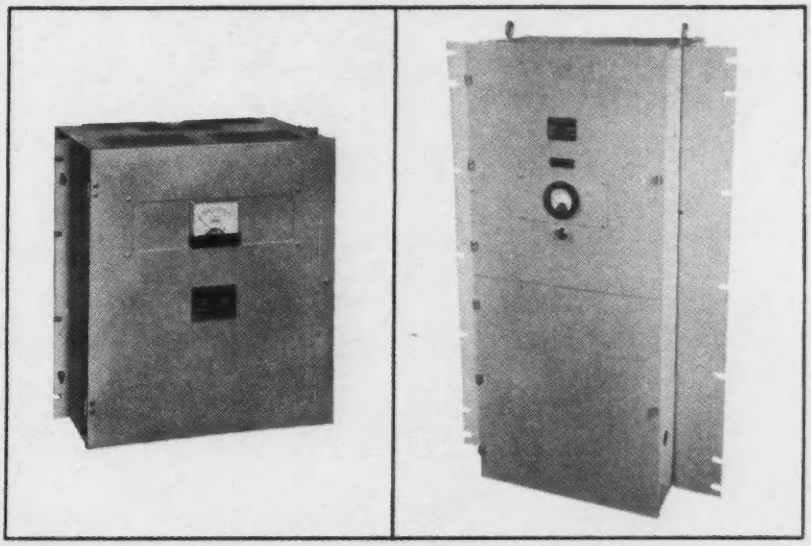
in the power field with Raytheon

Raytheon Company, Power Supply and Voltage Regulator Operations, Commercial Apparatus and Systems Division, Keeler Ave., South Norwalk, Conn.

RAYTHEON TELEPHONE POWER EQUIPMENT MEETS VARYING DEMANDS

Solving special telephone power supply problems is routine work for Raytheon's factory trained field applications and service engineers. From Raytheon's complete line of equipment covering all major needs, they come up with the answer that best suits your particular requirements . . . and make certain that your equipment is properly installed and serviced.

In telephone exchanges throughout the country, Raytheon Rectichargers,® Rectiringers,® Rectifilters® and other power supply equipments are in service around the clock. You'll find them in applications ranging from toll-ticketing power to main dial installations serving 4,500 terminals or more. FOR ON-THE-SPOT SERVICE, from the Raytheon Sales and Service Office nearest you see the YELLOW PAGES or write to the address at right.



TYPICAL UNITS in Raytheon's broad line of modern battery charging equipment are this 18-amp., single phase, silicon Recticharger (left) and 25-amp., three-phase, silicon Recticharger (right).

NEW RAYTHEON BATTERY CHARGERS SMALLER, LIGHTER, MORE EFFICIENT

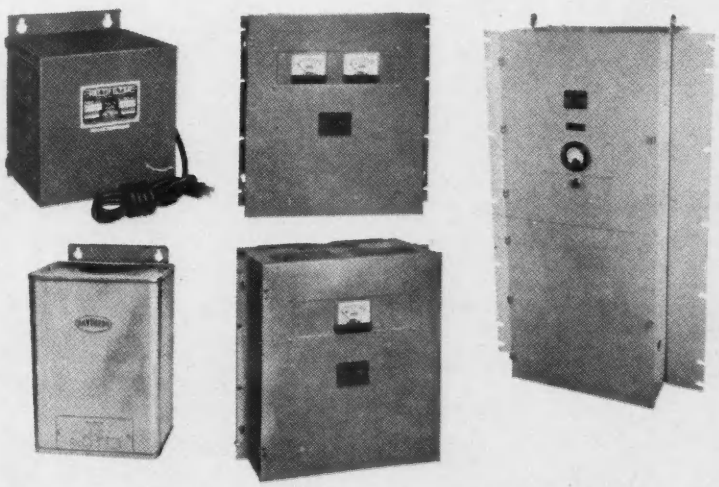
Raytheon's improved line of battery chargers now employ reliable silicon semiconductors for greatly improved rectifier efficiency. The thoroughly tested models are up to 50% smaller and lighter than comparable selenium units.

Typical Rectichargers shown above maintain batteries at full charge under all load conditions, and at the same time supply the full power requirements of the load. Output filtering reduces ripple to 30 millivolts, well below the audibility level. Output voltage is precisely regulated to within ± 1% from no load to full load and for line changes to ± 10%.

Raytheon telephone applications engineers are ready to demonstrate how Raytheon closely regulated battery chargers can bring longer battery life and significant reduction in battery maintenance to your installation. For information or engineering assistance, please write Raytheon Company, Power Supply and Voltage Regulator Operations, Commercial Apparatus and Systems Division, Keeler Avenue, South Norwalk, Connecticut.

A COMPLETE LINE OF POWER SUPPLY EQUIPMENT

RECTICHARGER BATTERY CHARGERS · 3 to 400 AMPS, 24, 50, 130 and 140 volts
RECTIFILTER BATTERY ELIMINATORS · RECTIRINGER RINGING POWER SUPPLIES · AUXILIARY CHARGERS · ALL POWER SUPPLY ACCESSORIES



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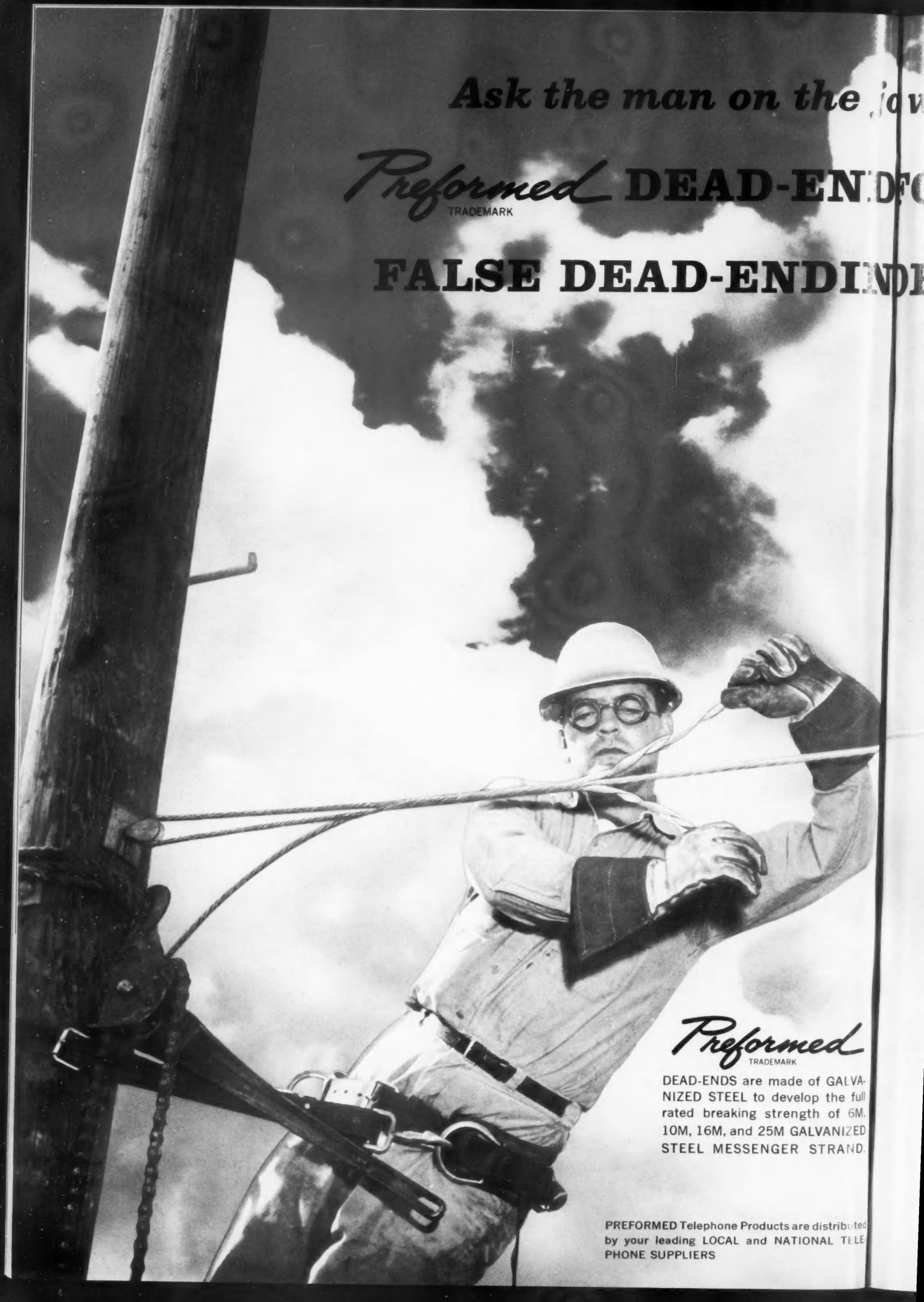
Excellence in Electronics

In the power field... Raytheon power supplies for: PBX · PABX · MANUAL · STEP-BY-STEP X-BAR · AUTOMATIC TOLL TICKETING · ELECTRONIC SWITCHING · CARRIER · MICROWAVE


Ask the man on the
Preformed
TRADEMARK
DEAD-EN
FALSE DEAD-ENDIN
Preformed
TRADEMARK
DEAD-ENDS are made of GALVANIZED STEEL to develop the full rated breaking strength of 6M, 10M, 16M, and 25M GALVANIZED STEEL MESSENGER STRAND.
PREFORMED Telephone Products are distributed by your leading LOCAL and NATIONAL TELEPHONE SUPPLIERS

...why do LINEMEN PREFER ...FOR FASTER, SAFER, NEATER ...OF MESSENGER STRAND

FASTER

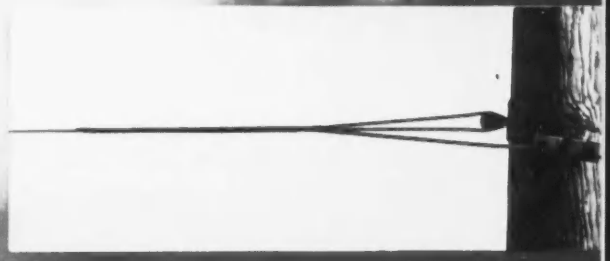
because one-piece PREFORMED Dead-Ends are applied WITHOUT CUTTING THE MESSENGER. They are easily wrapped onto the strand by hand without tools. No bolts to tighten, or jaws to be seated. No clamps that will slip. The tiresome business of threading 10 to 15 feet of messenger strand "through the eye of a needle" is eliminated, and there are no small parts to be dropped.

SAFER

because UNIFORMITY OF ALL APPLICATIONS is assured. There's NO DANGER OF INJURY from strand flying loose when it is being cut or bent because PREFORMED Dead-Ends are wrapped on straight strand. There is a built-in SAFETY FACTOR because this PREFORMED accessory is designed to hold the full strength of EXTRA HIGH STRENGTH strand. WIDE AREA SUPPORT eliminates high stress concentrations of vise-type attachments.

NEATER

because the streamlined one-piece PREFORMED Dead-End looks just like the messenger strand. Material compatible with the strand is used in its manufacture to minimize rust and corrosion.

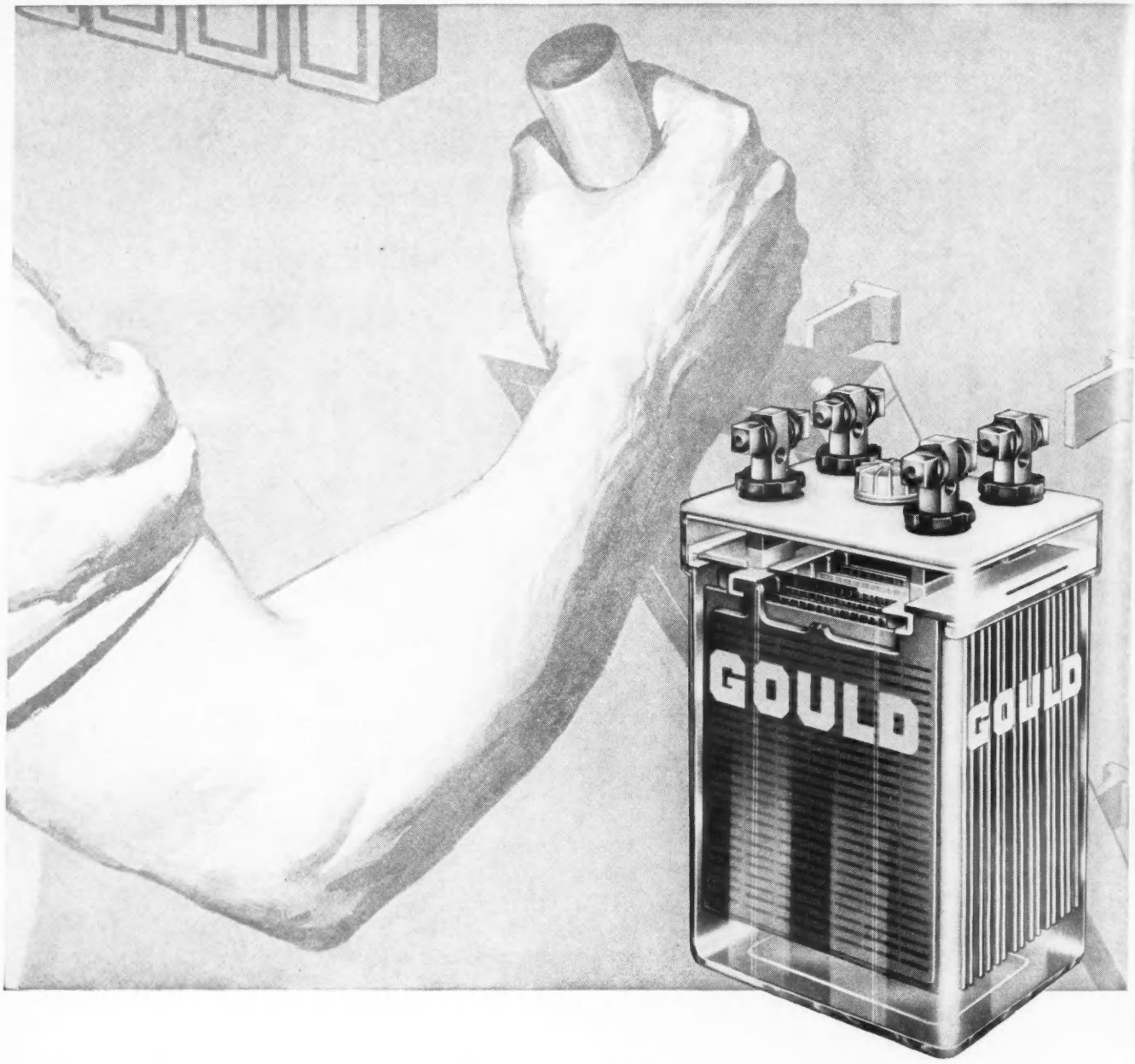


Write for: Application Procedure, Specifications and Prices

PREFORMED LINE PRODUCTS COMPANY
DEPT. DE-T1

5349 St. Clair Avenue • Cleveland 3, Ohio • EXpress 1-3571
600 Hansen Way • Palo Alto, California • DAvenport 4-2561

Patented — U.S. Patent No. 2,761,273



Big power when you need it...

GOULD Stationary Batteries

In emergencies—when quick, reliable current is needed for longer than a moment—new Gould Stationary Batteries in Plastrite Jars offer long, trouble-free service either full float or cycle operation.

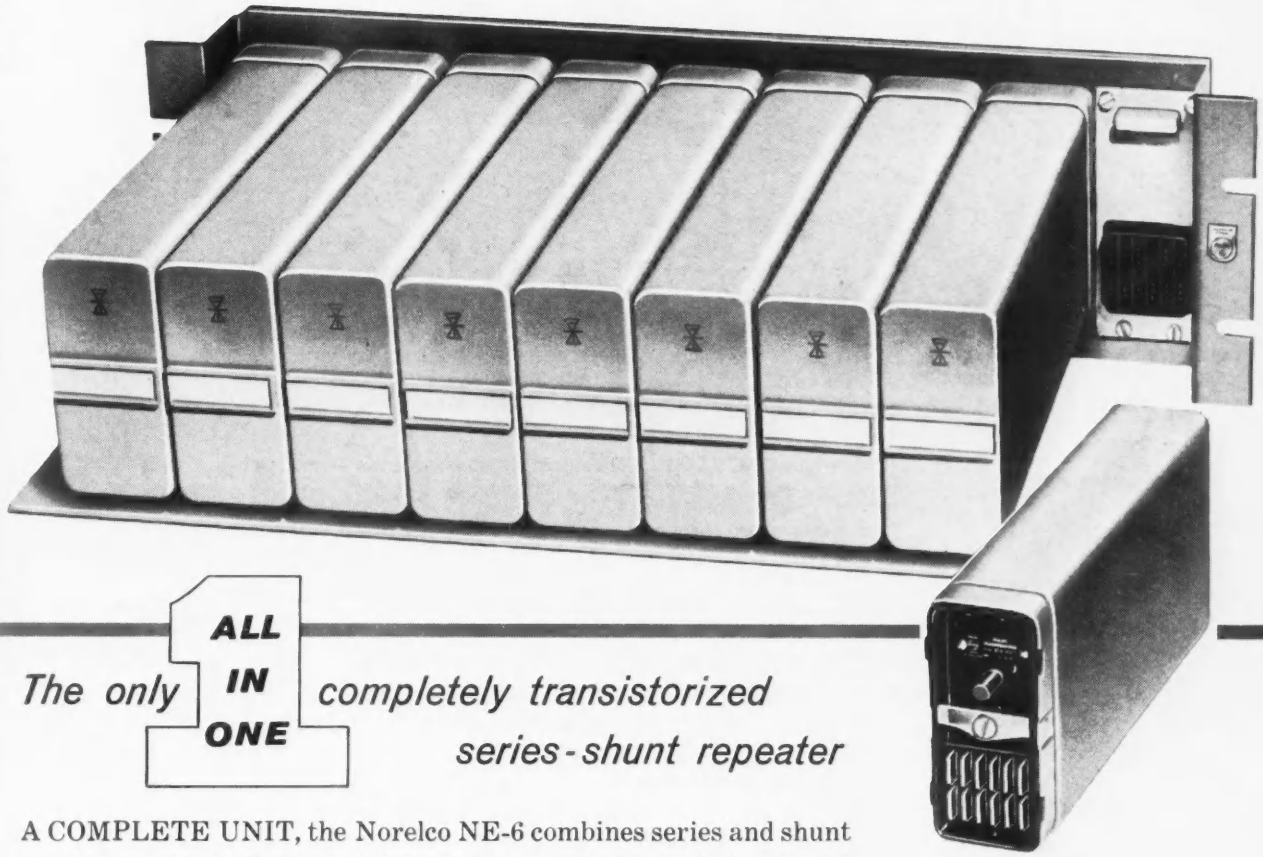
Dependable power through proper design. New Silicone O-Ring post seal expands under compression, prevents escape of electrolyte. New stronger posts assure full current-carrying capacity with maximum voltage. Improved element suspension eliminates cover breakage due to weight of battery element.

Greater Power per square inch. Gould's new Stationary Batteries in Plastrite Jars save you 30-40% more floor space; this means you can increase your battery room capacity without increasing the room size. Lightweight Plastrite Jars have great impact resistance, are unharmed by normal handling and shipment.

Gould Stationary Batteries in Plastrite Jars are available in Planté, Calcium, or Kathanode. Write for details today, or call your local Gould office listed under "Batteries—Industrial" in the Yellow Pages. Gould-National Batteries, Inc., Trenton 7, N. J. In Canada, write to Gould-National Batteries of Canada, Ltd., 1819 Yonge Street, Toronto, Ont.

More Power to you from **GOULD**

Norelco® INTRODUCES NEW NE-6 VOICE REPEATER



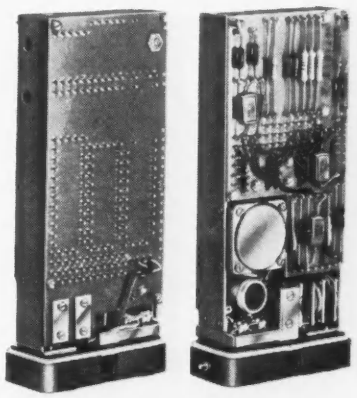
ALL IN ONE

The only **ALL IN ONE** *completely transistorized series-shunt repeater*

A COMPLETE UNIT, the Norelco NE-6 combines series and shunt repeaters with built-in network. It is suitable for both trunk and subscriber circuits, loaded or non-loaded. It can pass A.C. and D.C. signals. The NE-6 operates on a 24 or 48 volt central office battery, and each repeater requires only 15 ma. A standard nine foot rack holds 180 repeaters. Modern plug-in type construction permits the repeater to be removed from the line without interrupting the circuit.

Check these important features:

1. Suited for loaded or non-loaded facilities.
2. Operational gains:
   Intermediate Repeater: 17 db
   Terminal Repeater: 8 db
3. Compatible with A.C. and D.C. signalling.
4. Operates on central office battery, 24 or 48 volts ±30%.
5. Compact, airtight plug-in construction.
6. High quality components.
7. Quick and easy to install.



The simple strapping panel on one side of the repeater allows quick and easy network balancing by interconnection of soldering pins which are clearly marked with element values.

For full details contact your local distributor or:

NORTH AMERICAN PHILIPS COMPANY, INC. TELEPHONE PRODUCTS AND SYSTEMS DEPARTMENT
100 EAST 42nd STREET, NEW YORK 17, NEW YORK

NEW! EXTRA LONG RECEIVER Koiled Kords*

NOW IN COLOR

Extra long receiver KOILED KORDS in color enable you to offer another service to those subscribers who want to move more than four and a half feet from their instruments.

New, long KOILED KORDS retractile cords in color — and in black — are offered in two standard lengths, 18 inches retracted that extend to approximately 9 feet and 30 inches retracted that extend to 15 feet.

Extra long receiver KOILED KORDS are available in colors to match all telephones. See your telephone supply house for full information.

Koiled Kords
INCORPORATED

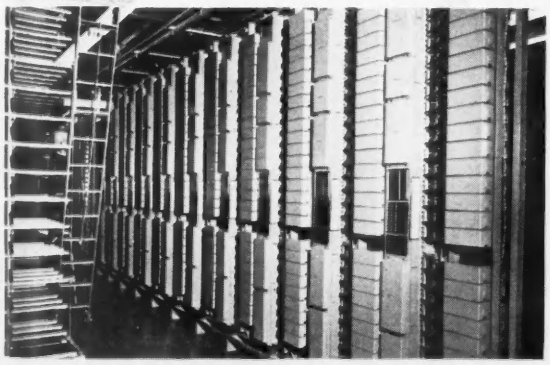
BOX K, NEW HAVEN 14, CONNECTICUT

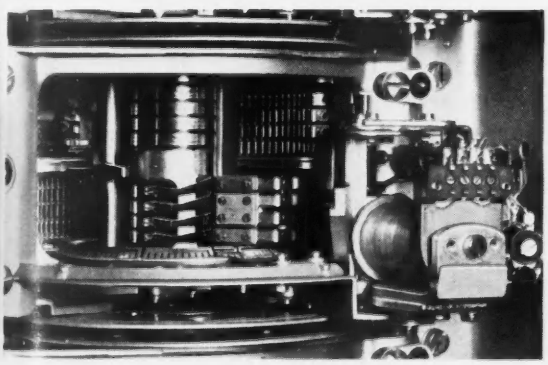
KOILED KORDS, the original retractile cords, are the result of 17 years of research, development and use.

* KOILED KORDS is a trade mark of KOILED KORDS, INC.

MADE FOR EACH OTHER

USI MOTORSWITCH AND DIRECT DISTANCE DIALING





USI Motorswitch System is ready and waiting for your Direct Distance Dialing Conversion

Offering flexibility with simplicity to provide superior customer service at reduced maintenance and operating costs with these added U. S. I. features:

1. 100% regeneration of dial pulses.
2. 100% precious metal contacts in all talking circuits.
3. Simplified intercept of dead numbers.
4. Free subdivision of outlets offering large or small group grading.
5. Four-wire switching throughout.

For more information about the modern USI Motorswitch System, call or write Sales Department.

UNITED STATES INSTRUMENT CORPORATION

CHARLOTTESVILLE, VIRGINIA

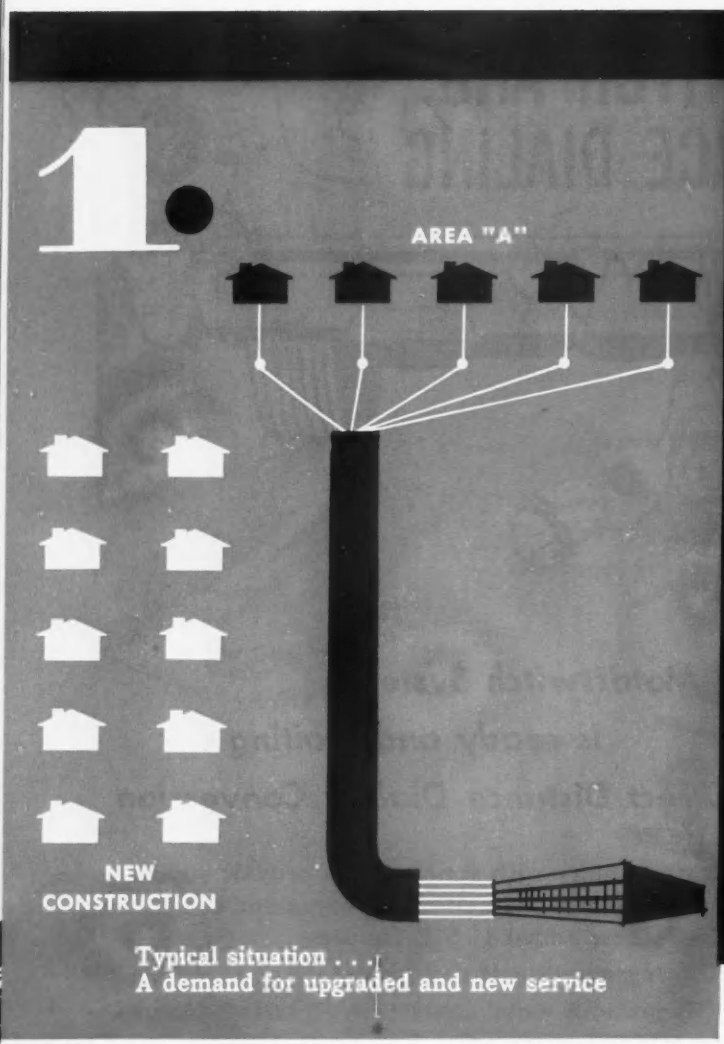
USI CORP.

for greater profit . . .

ITT KELLOGG LINE

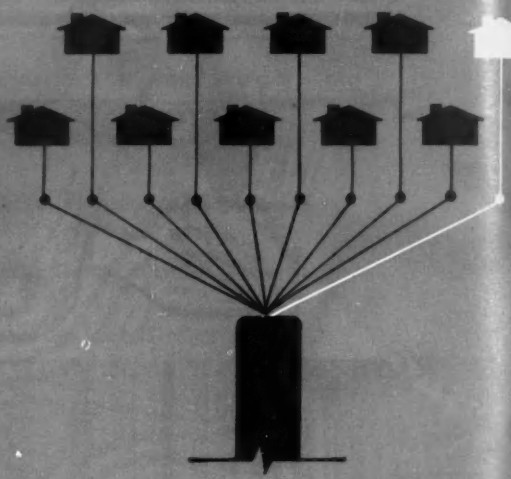
● *here's how it works*

1.



Typical situation . . .
A demand for upgraded and new service

2.



90% of the lines are idle!

Your cable pairs are in use less than 10% of the time

● *and it costs less than a mile*

WHERE & WHEN TO USE A KELLOGG LINE CONCENTRATOR. Saves you the expense of installing new lines in a wide range of applications such as new suburban developments, resort areas, military installations, outlying plants, hotels, motels, trailer parks, county fair and other special event areas...The ITT Kellogg Line Concentrator is a low-cost, high-grade, permanent substitute for cable additions.

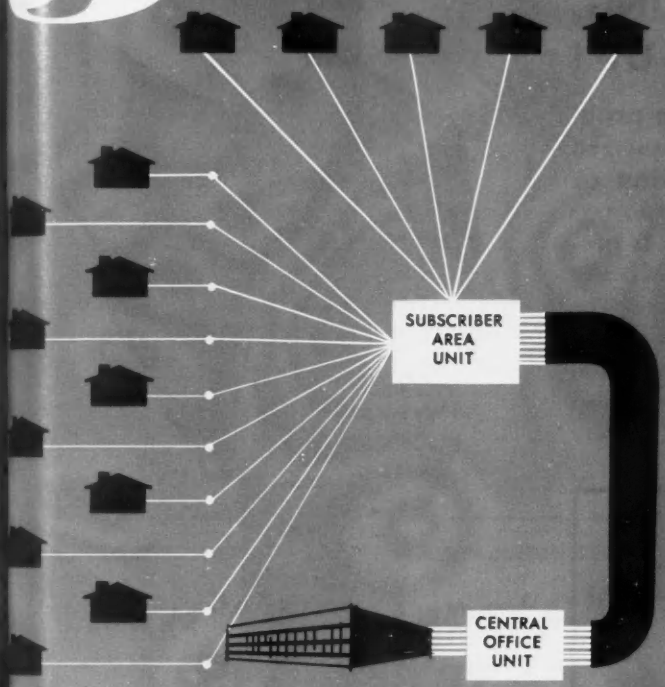
EASILY INSTALLED; ECONOMICAL. These electro-mechanical devices require *no* additional cable, *no* changes or modifications of *any* sort (except jumpering) in either central office or subscriber station equipment...can be installed and put into operation in a matter of days—by your own crew. Rapid amortization of investment. Available (from stock) in 2 basic models. Entire cost: *less* than the cost of a mile of 19 gauge, 26 pair cable!

Concentrator systems, although relatively new in this country, have, for years, been successfully used in Europe. Kellogg, while fully utilizing the great technological advances achieved by European ITT experts in this field, has advanced and adapted concentrator systems to meet the requirements of the operating telephone industry of the United States.

Regional Offices and Warehouses: **CALIFORNIA:** 23 Broderick Road, Burlingame, California, OXford 7-5780. **GEORGIA:** 1594 Southland Circle, N. W., Atlanta 18, Ga., SYcamore 4-2441. **ILLINOIS:** 4600 So. Tripp Ave., Chicago 32, Illinois, CLiffside 4-4300.

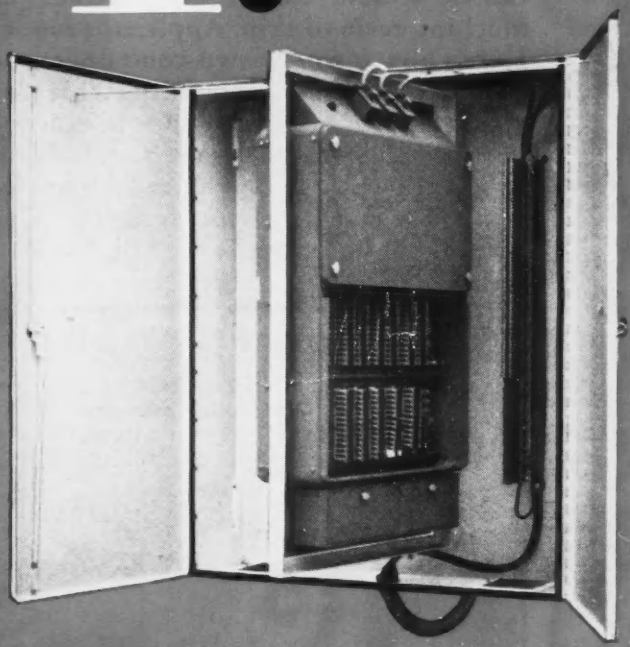
concentrate with the
CONCENTRATOR

3.



The concentrator expands total service by sharing cable pairs. 52 lines are derived from 14 cable pairs or even 104 lines from 20 cable pairs.

4.



Kellogg Line Concentrator performs all these operations without degrading service.

hamile of 19 ga. 26 pair cable!

For complete details and technical information, or an appraisal of your needs, fill in the coupon at right.

ITT KELLOGG

A Division of
International Telephone & Telegraph Corporation
6650 South Cicero Avenue, Chicago 38, Ill.

Telephone and Transmission Dept.
2912 Wake Forest Road, Raleigh, N.C.

ITT Kellogg products available in Canada through Standard Telephones & Cables Mfg. Co. Ltd., 9600 St. Lawrence Boulevard, Montreal 12, P.Q., Canada

ITT Kellogg
Marketing Dept., 6650 South Cicero Avenue
Chicago 38, Illinois

☐ Please send me further details on your Line Concentrator
☐ Please arrange to have an engineer call to appraise our Concentrator needs

Name_____

Title_____

Company_____

Address_____

KANSAS: 7th & Sunshine Road, Kansas City 15, Kansas, MAyfair 1-4418. **NEW YORK:** 327 North West Street, Syracuse, N. Y., HArrison 2-9251. **TEXAS:** 1359 Motor St., Dallas 7, Texas, Riverside 7-5191. **EXPORT:** 4600 So. Tripp Ave., Chicago 32, Illinois, CLiffside 4-4300.

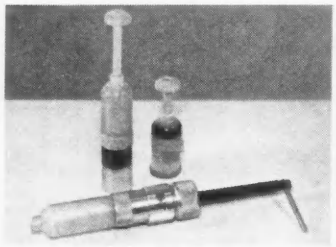
END PLUGGING PROBLEMS!

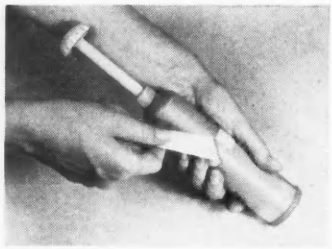
NOW USE RESIN WITHOUT MIXING, SKIN CONTACT OR CLEAN-UP!

This amazing new invention ends your plugging problems forever! It enables you to apply resin to pressurized cables without chance of incorrect proportioning or touching resin to skin. Applicator never needs cleaning. Here's how it works: two-component epoxy resin is prepacked in handy plastic Disposable Cartridge. Mixing takes place *inside* the cartridge in exactly the correct proportions every time. It's absolutely foolproof. Many telephone operating companies are now using this simple, modern, efficient new method. Learn *today* how it can reduce *your* costs. Write for full details.

OPERATION:

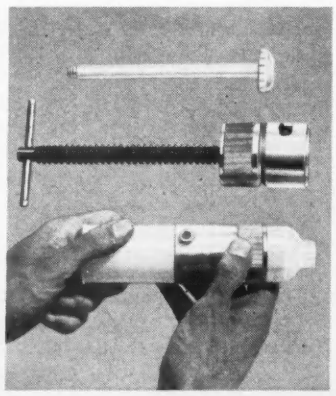
Equipment consists of LD-755 Injection Gun and choice of two sizes of Cartridge—LD-6 (6 oz.) or LD-2 (2 oz.). Two-component Devcon-D Cable Plugging Compound is prepacked in Cartridges.





1. Remove tape clinch band from Cartridge.
2. Rotate dasher rod until material is completely mixed.
3. Remove dasher rod and insert Cartridge in Injection Gun for application.
4. Attach fitting to cable and eject resin.
5. Remove Cartridge from Gun and discard.

(Patent No. 2,838,210. Others Pending)

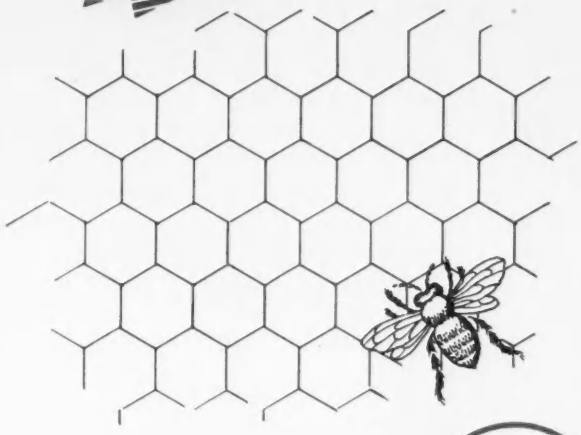


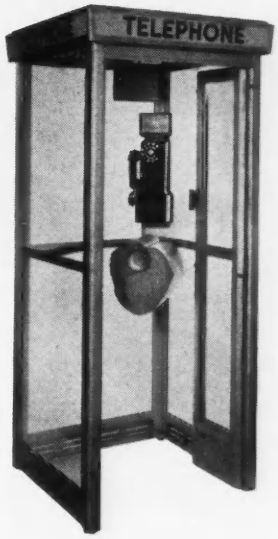
◀ Disposable Cartridge Contains Resin

ATLANTA WAREHOUSE
590 Piedmont, N.E., Atlanta 8, Ga.

LINDSAY TELEPHONE SUPPLY COMPANY
360 E. HIGHLAND ROAD NORTHFIELD, OHIO

PROVED BEST in construction





Strength with simplicity — imaginative engineering produces a strong, rugged structure with clean, simple, attractive lines.

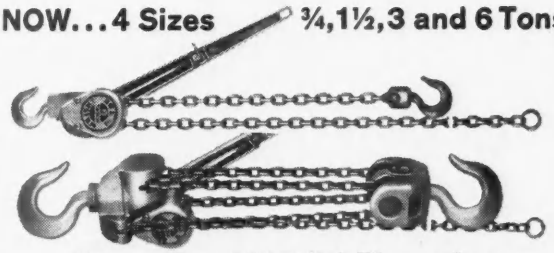
the BN Booth

For full particulars, consult your distributor or write direct ...
Benner-Nawman, Inc., 3421 Hollis Street, Oakland 8, California.

a B-N booth is a busy booth!

New ¾-ton Type "C" Pull-A-Way

NOW... 4 Sizes ¾, 1½, 3 and 6 Tons



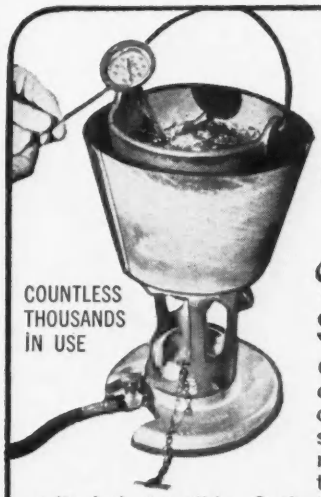
WRIGHT Type "C" Pull-A-Ways make easy work of hundreds of quick hook-up jobs. Now available in four sizes—¾, 1½, 3 and 6-ton—Type "C" Pull-A-Ways are portable, safe and rugged. Corrosion-resistant modern aluminum alloy castings are used for gear case, handle and covers of all models. Hooks, load chain and chain sheave are made of alloy steel. Positive, dependable load brake securely holds load at any point. Lubricated for life. Weights: ¾-ton, 12½ lbs; 1½-ton, 23½ lbs; 3-ton, 36½ lbs; 6-ton, 63 lbs.

Write to our York, Pa., office for Bulletin DH-56

WRIGHT HOISTS

Wright Hoist Division • American Chain & Cable Company, Inc. ACCO

York, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Bridgeport, Conn.



COUNTLESS THOUSANDS IN USE

READ AT A GLANCE
•
INSTANT RESPONSE
•
HUSKY CONSTRUCTION
PROVIDES MANY YEARS OF REAL SERVICE
•

Dillon STAINLESS STEEL TEMPEROMETER

One of the handiest, most dependable "tools" in any cableman's kit. Stainless steel construction defies rough treatment and makes these precision units practically indestructible. Outlast glass thermometers many times over. Range is 200 to 1000° Fah. Dial diameter is 2¼". Stem length is 7¾". Furnished with handle. Decide **today** to eliminate porous cable joints. Accurate Dillon Temperometers cost very little yet offer real insurance against this hazard. Dial shows recommended temperature for wiping solder, paraffin, impregnation waxes, etc.

Satisfied owners in the telephone and utility fields specify Dillon Temperometers as **standard** equipment. Shipment is from stock at the factory or orders may be placed with leading jobbers. Illustrated bulletin upon request. No obligation!

W. C. DILLON and CO., INC.

14590 KESWICK ST., VAN NUYS 17, CALIF TEM-01

stallation, plowing, and burial.

Should you select PCP or PCPG?

The difference between Anaconda PCP and PCPG cables is a difference in thickness of the corrosion-resisting, low-resistance copper shield. PCP cable, having a 0.005-inch shield, is intended to withstand attack by termites and small rodents, such as field mice. PCPG cable, with a 0.010-inch shield, is for use in areas where gopher attack is a possibility.

Find out if direct burial of Anaconda PCP or PCPG cable can help you reduce your operating and maintenance costs.

Call your nearest Anaconda district office direct. Or write: The Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

60245

PHONE THE MAN FROM

ANACONDA®

FOR PCP AND PCPG TELEPHONE CABLE

the independent manufacturer
for the independent telephone industry

Bury your maintenance costs with Anaconda PCP and PCPG cables

rect burial offers many cost-cutting possibilities – (1) edom from storm damage, (2) freedom from tree-clearing d retrimming expenses, (3) freedom from the hazards ociated with power contacts and pole climbing, (4) free- m from right-of-way procurement difficulties.

Anaconda PCP and PCPG cables offer you *extra* cost-ting features. Here are a few of them:

Outstanding resistance to lightning dam-ge – a copper shield and a high-molecular-weight poly-ylene belt over the core make the over-all cable highly sistant to lightning damage. The high-molecular-weight polyethylene conductor insulation protects against conductor-to-conductor lightning damage.

2. Water vapor will not cause failure – because of the excellent moisture resistance of the high-molecular-weight polyethylene insulation.

3. Full color coding – makes for low-cost installation by fast, easy splicing and terminating. Eliminates test splicing. All it takes is a one-man crew. And – all these advantages are repeated every time you add or change terminals.

4. Easy handling – this lightweight cable with its rugged corrugated shield permits easy handling during in-

RECEPTIONIST

Graybar, too, recommends the most modern equipment... for the best of service

The ever present need for the best available telephone service often requires that old standbys be replaced with modern equipment.

Like you, Graybar, too, knows this – having served and grown with the independent telephone industry from the very beginning.

The telephone equipment you get from Graybar is tested and proved. It is the most modern available from the nation's leading manufacturers. It is equipment that will do the job with the utmost efficiency and at minimum cost over the years of its service life.

When the time comes to match modern equipment with good service, to talk equipment changes – anywhere along your lines – call in the Graybar man.

Graybar is your number one source for service... technical assistance...quality equipment...prompt delivery.
940

GraybaR

ELECTRIC COMPANY, INC.

420 LEXINGTON AVENUE, NEW YORK 17, N. Y. • OFFICES IN OVER 130 PRINCIPAL CITIES

Everything Electrical GraybaR ELECTRIC COMPANY

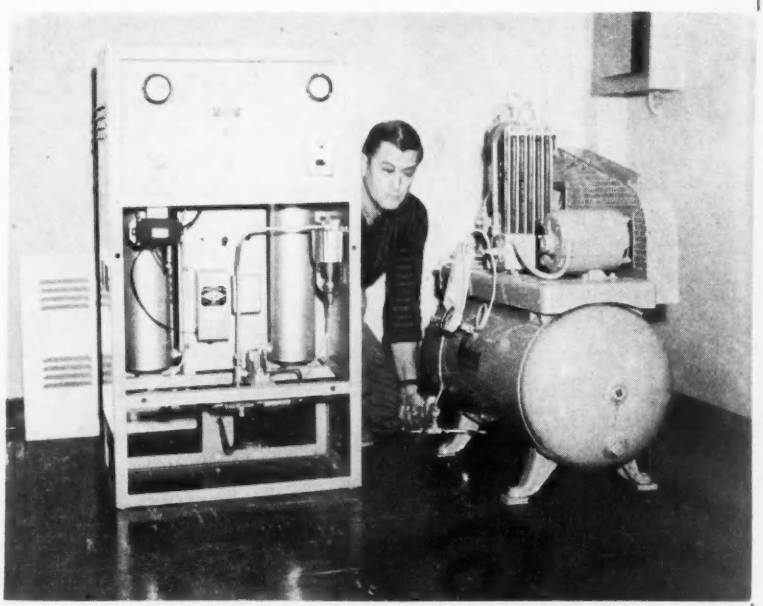
United Telephone of Pennsylvania reports...

"Not a single case of cable failure due to water trouble"

with S&G **AIR COMPRESSOR DEHYDRATORS**

and Accessories

S & G developed the dry air dehydrator used extensively by many operating telephone companies to protect telephone cables from moisture. According to J. Howard Federhoof, Plant Engineer for The United Telephone Company of Pennsylvania, the use of S & G equipment of this type has made it possible to locate breaks in the sheath, bad joints and bullet holes *before* they cause trouble — and that the work could be done during regular working hours, eliminating men working in bad weather, nights and overtime clearing cable failures.



This installation of the S & G Model A Dehydrator at the Chambersburg, Pa. District of The United Telephone Company of Pennsylvania is typical of the many hundreds of units now operating satisfactorily and economically in and out of the United States.

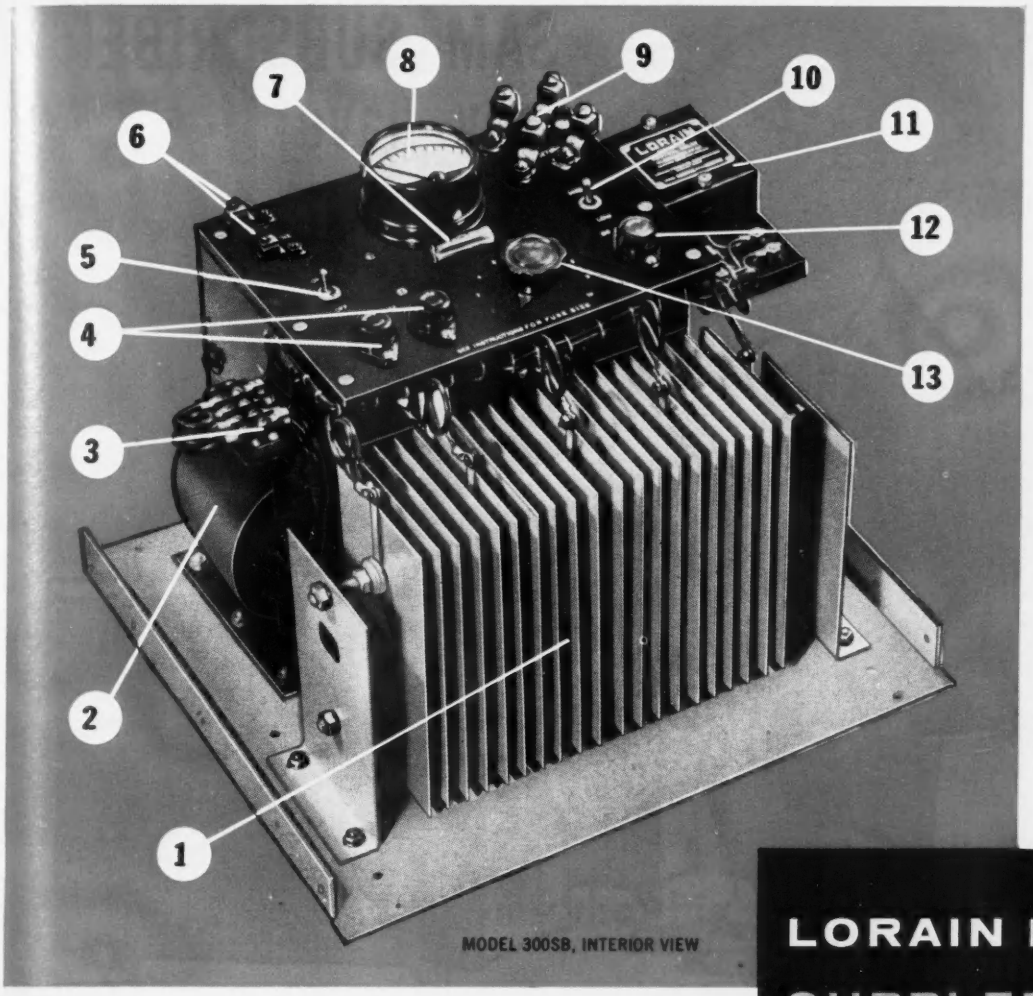
Users of S & G Dry Air Dehydrators (Desiccant Type) cite these advantages:

- Dries insulation faster and more efficiently than other types
- Eliminates cable moisture
- Saves maintenance hours
- Saves maintenance dollars
- Converts dollar savings into earnings
- Better service to customers
- Cable plants prepared for dry air dehydrators definitely reduce maintenance cost
- Cost of installing dry air dehydrators is minor compared to the many advantages gained

S & G Dry Air Dehydrators (Model A or Model RC) are available to suit your cable plants. There is no easier way to improve your operations and earnings than by the S & G dehydrator.

order through your favorite distributor
for information, write or phone

S & G MANUFACTURING CORPORATION
P. O. Box 1309 • New Orleans 10, La. • JAckson 5-3142



MODEL 300SB, INTERIOR VIEW

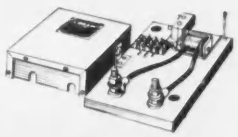
1. Selenium rectifier
2. Isolating transformer
3. Taps to adjust for A-C line voltage
4. A-C line fuses
5. On-off switch
6. A-C input terminals
7. Neon lamp to indicate tripping of overload relay
8. Output ammeter
9. D-C connections
10. Output range selector switch
11. Control relay, type FS1R
12. D-C load fuse
13. Tap switch

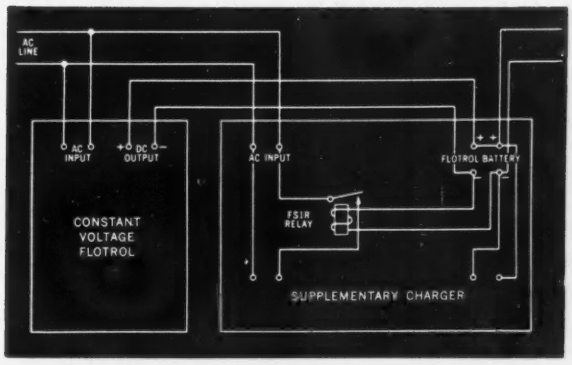
LORAIN FLOTROL SUPPLEMENTARY CHARGERS

For peak loads and growing plants . . . save money with "a Flotrol and a half"

Here is the low-cost answer to expanding loads that are taxing the capacity of your charger. A Lorain Supplementary Charger matched to your Flotrol as much as doubles its capacity at a fraction of the cost of a larger Flotrol. It is also used in new installations to get an "in-between-size" Flotrol and avoid paying for un-needed capacity. The Supplementary Unit delivers a constant current which is adjustable by a tap switch. Controlled by the master Flotrol, it provides a closely regulated output voltage. A control relay shuts the unit off when it is not needed. Proved in service since 1950. Thousands in use. Seven models, with output from 3 to 24 amps., 45-56 and 25 volts. Rack or wall mount. Write for Bulletin 171A.

FS1R Control Relay is mounted inside the unit and is wired as below. Externally mounted control relays (see right) are offered to simplify heavy wiring for the larger Flotrols.





POWER EQUIPMENT FOR COMMUNICATIONS AND INDUSTRY

our equipment is sold through leading telephone distributors

FLOTROL SUB-CYCLE

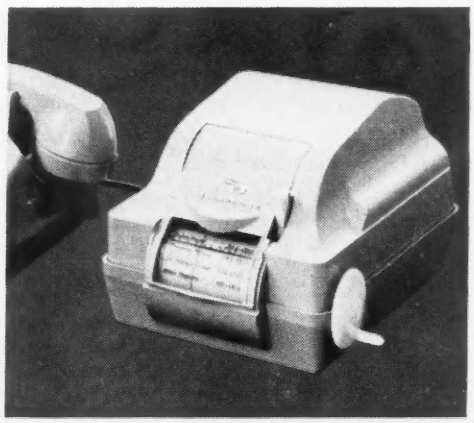
LORAIN *Products Corporation*

1122 F Street Lorain, Ohio Phone: ATlantic 8-9191

SAM SUBSCRIBER may have *DIALITIS!*

Sam places dozens of phone calls daily – many to the same customers, suppliers or branch offices. Dialing each number every time he calls, Sam now exhibits the undeniable symptoms of DIALITIS: strain of the patience...fatigue of the index finger...wrong numbers...pinched profits through lost time. But there is one sure cure – DIALAPHONE – the electro-mechanical wonder which dials numbers automatically with one touch of its magic key, while it further serves as a handy directory and infallible memory for hundreds of numbers.

Only *you* can provide Sam with this relief. For DIALAPHONE is available to him *only* through telephone operating companies such as yours. Sam *needs* DIALAPHONE! And, of course, the better you serve him, the better you serve yourself in revenues and public relations.



- **Available in colors to match any telephone.**
- **Accommodates up to 850 names and numbers on its alphabetically indexed color-coded tape.**
- **Handles any dialing configuration; e.g. operator assisted, area, access, 9 level and DDD.**

Ask us for descriptive sales aids and technical information to help you promote DIALAPHONE now! If you don't yet have your demonstrator, order it today! Write or call:

DIALAPHONE

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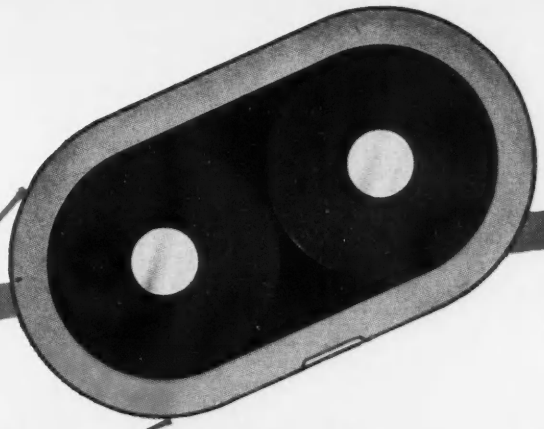

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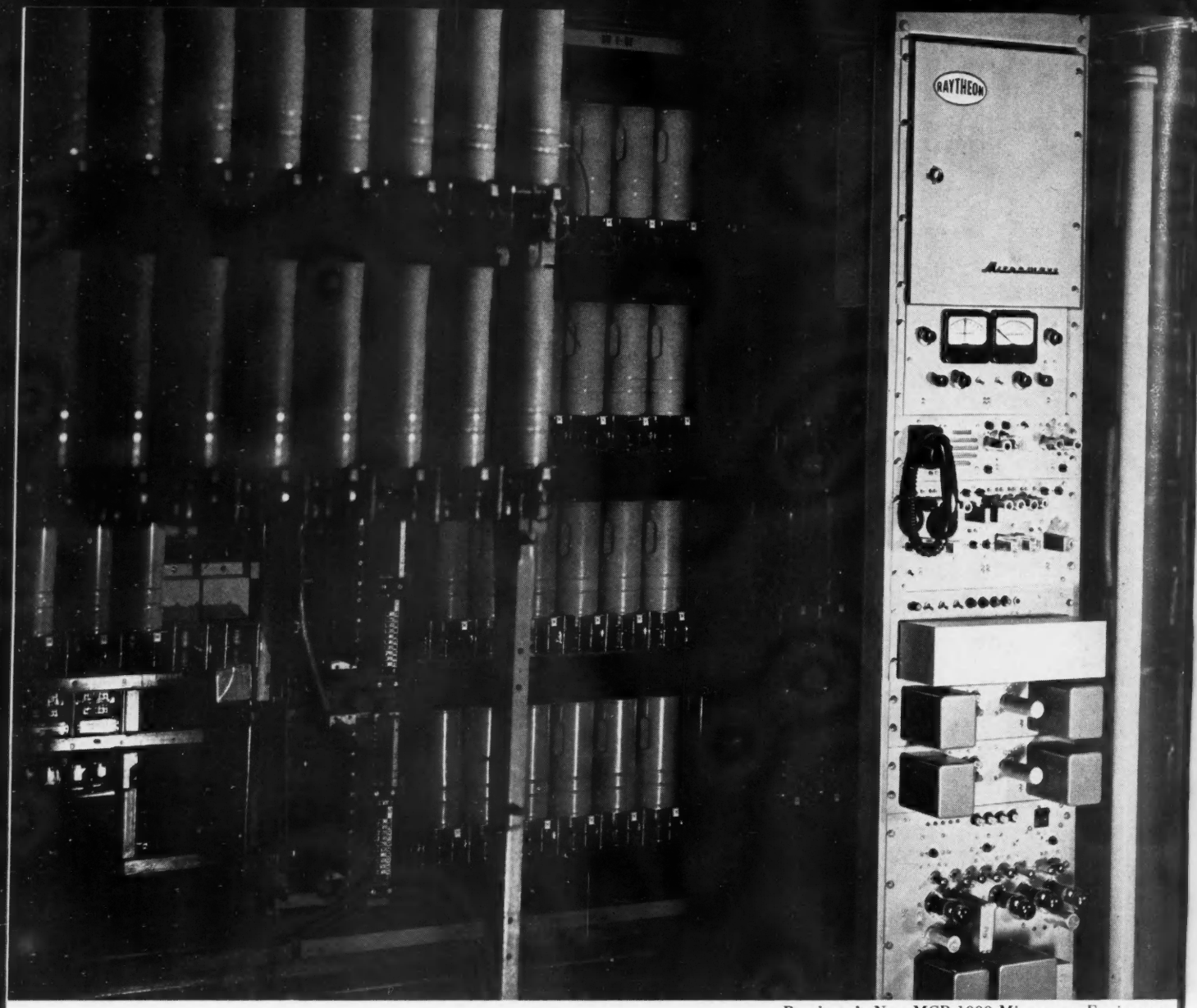

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EDITORIAL

"Planning For The Future"

ALTHOUGH the men and women attending the 63rd annual convention of the United States Independent Telephone Association at the Conrad Hilton Hotel on October 9-12 were and are proud of their classification as "*telephone people*," throughout the four-day meeting the speakers and the delegates plainly indicated that the word "*communications*" better describes the telephone job of today and tomorrow.

This emphasis on the industry's "*communications job*" started making itself known to the men and women who attended the USITA convention at the Conference for REA Borrowers on Sunday, October 9, and it continued through the conferences and general sessions to the closing announcements by the USITA president on Wednesday, October 12.

The Assistant Vice President-Engineering of the General Telephone Co. of California, *B. H. Pryor*, emphasized the present and future importance of the word "*communications*" at the USITA Engineering Conference on October 10, when he stated — "*rather than thinking in terms of telephones, it is mandatory that we broaden our thoughts to include all forms of communications . . .*"

Stating the telephone industry has the responsibility for providing the means to permit the exchange of information between any two or more points in a network, Mr. Pryor emphasized that "*we must gird ourselves to provide a completely integrated switching network which will handle all forms of communications . . .*"

"*Today*," Mr. Pryor stated, "*we may still have justification for distinguishing between exchange and toll networks, although I believe we will have to come to think in terms of one integrated network.*

"*Toll is distinguished by certain switching or transmission standards today, although the time does not appear far removed when this distinction may be justified by tradition only. Due to special circuit bandwidth requirements, it is conceivable that a second or even a third network may be necessary, but nevertheless, we will soon be faced with the responsibility of handling 'machine talk' in much the same fashion that 'people talk' is handled today. Who is it that will deny that 'machine talk,' or data, if you like, may be the major part of our future communications business?*"

Although Mr. Pryor was directing his remarks at the industry's engineers, similar thoughts were brought to the front by other USITA convention speakers who urged their listeners to concentrate their efforts and their abilities on long-range planning functions that will enable them as *communications common carriers* to provide the customer with the service he needs for his *communication purposes.*

This all-out concern with keeping pace with the *communications* needs of customers is all to the good. It speaks well for the telephone industry. It indicates the industry's men and women realize that although the past has been filled with accomplishment, the true measuring stick that will be applied to their work will concern itself with what they accomplish in the future.

There was much evidence of such concern at the recent USITA convention. For one, the exhibits of equipment and supplies proved today's industry members are concerned with such things as *carrier, microwave, radio, data transmission* and many other types of apparatus and equipment which promise to include new components and systems that will take the telephone industry far away from the systems of the past and present.

We believe it was plainly evident that the telephone industry members attending the meeting worked hard at *determining the exact nature of the future, foreseeing the problems, formulating plans on a long-range basis, and making an orderly arrangement of the steps necessary to accomplish their objectives.*

And that is exactly as it should have been, for we feel sure that as long as the telephone men and women of this country feel it is the future that really counts, the industry will move ahead toward new peaks of service accomplishment that will surpass accomplishments of the past.

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USITA Holds 63rd Annua

Group photos shown on this page and the opposite page were taken during recent USITA convention.

Approximately 3,300 members of the telephone industry attended the 63rd annual convention of the U. S. Independent Telephone Association at the Conrad Hilton Hotel, Chicago.

aConvention

By JOHN G. REYNOLDS

MANAGERS and supervisory personnel of the nation's 3,560 Independent telephone companies, serving nearly 11 million telephones in 11,000 communities in the United States, its possessions and territories, moved into Chicago for the 63rd annual convention of the United States Independent Telephone Association, and approximately 3,300 men and women registered for the four-day meeting, October 9-12, at the Conrad Hilton Hotel.

Featured speakers at the sessions included USITA President Foster B. McHenry, president of the Capital City Telephone Co., Jefferson City, Mo.; J. Lewis Powell, nationally known author and lecturer, Washington, D. C.; Don G. Mitchell, president of General Telephone & Electronics Corp., New York City; and Dr. A. D. Holt, president of the University of Tennessee, Knoxville.

Features included two general sessions, an entertainment session sponsored by the Independent Telephone Pioneer Association, the annual USITA banquet and dance, two floors of exhibits of equipment and supplies, plus six technical conferences — *Accounting, Commercial, Engineering, Plant, REA Borrowers,* and *Traffic.*

USITA President McHenry emphasized the convention aim at the first general session, on October 10, when he told the convention, "We have come here to compare notes and exchange information and to gain information and inspiration that will help us in the successful conduct of our business in the year ahead."

"Our prospects are excellent," Mr. McHenry said, "*if* we grasp our opportunities, and if we face squarely up to the challenges ahead . . ."

Stating that great changes have taken place in telephony during the last 10 years, President McHenry emphasized that today "our competitors are snapping at our heels, constantly looking for ways of invading the common carrier field."

"For these and other reasons," McHenry stated, "we must continue to take steps to strengthen public faith in us as a service organization and to place our companies and their employes at the highest possible level in the opinion of our customers and the public . . . We must not only be good but we must develop in the public the belief that we are the best."

Another phase of "competition" was discussed in the report of USITA Executive Vice President Clyde S. Bailey, which pointed out that the rate of return ratios for Independent companies "seem unrealistically low, particularly in these inflationary times and in the light of competition factors that always exist in the money markets . . ."

Emphasizing the substantial importance which attaches to an adequate rate of return for a telephone company in these days of dynamic growth, Mr. Bailey

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USITA—Keystone Of Then

Two Chicago beauties, JUDEE CARR (left) and JOANNE OWENS, meet VERNON SPRAGUE of Fairmont, Minn. and R. H. MONROE of Simpsonville, S. C. at the USITA Convention.

TE&M Camera was busy at recent USITA Convention. Group photos (above and on opposite page) were taken at Chicago's Conrad Hilton Hotel.

ndependents By FOSTER B. McHENRY*

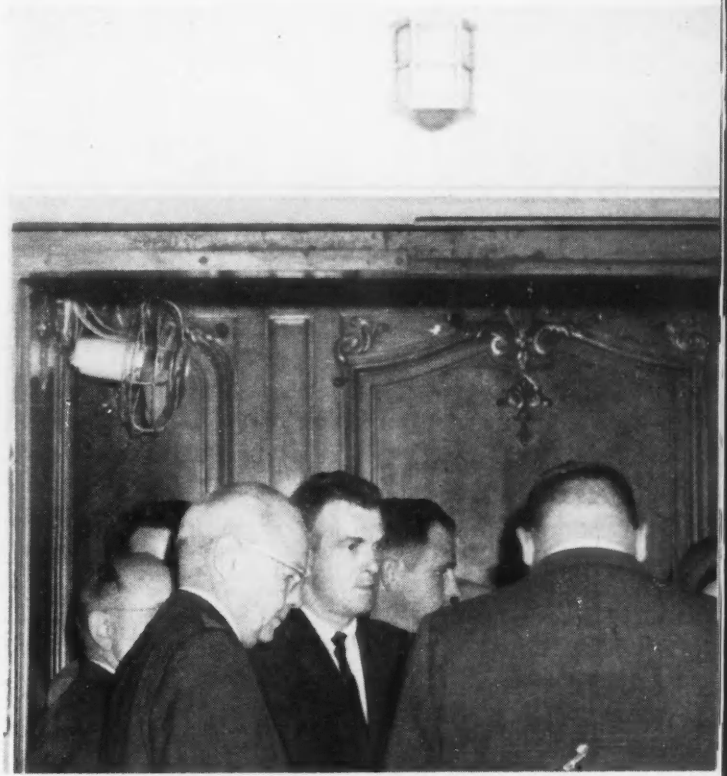
USITA Directors W. G. WINTERS, Houston, Texas (left), and R. A. LUMPKIN, Mattoon, Ill. (center), meet with ORLA MOODY, New York City between sessions.

T. DeWITT TALMAGE (left), Chicago, meets TEM's Circulation Manager PAT LAWHORN, Chicago, and JOE F. PRIBAN, Chicago, at USITA Convention.

**USITA President McHenry presented this address at the 1960 convention of the United States Independent Telephone Association.*

WE ARE entering a new era in the telephone business just as our nation is entering a new era, politically and economically. We are going to be confronted with many new challenges during the years immediately ahead, and I can see great opportunities for us if we use the means now within our grasp to see that the promising prospects for our industry are achieved. It is my sincere belief that one of the most important instruments for continued success will be the continuing organized and management-directed work of our national tool and voice, which we call the United States Independent Telephone Association.

That is why I have chosen as my topic, "USITA — Keystone of Independent Telephony." If you will look up the word "keystone" in the dictionary you will find it means: "*A part or force on which associated things depend.*" In my considered opinion we who are associated together in the ranks of the Independent telephone industry are going to become even more depend-



Elevators at Chicago's Conrad Hilton Hotel received night and day workouts during the recent USITA Convention.

Members of Iowa Independent Telephone Association's Plant Committee photographed in TE&M's exhibit room at the USITA Convention are (l. to r.): PETER C. BAKKER, Toledo; C. K. BYERS, New London; H. FILMORE MELICK, West Liberty; RALPH HURMENCE, Newton, and FRANK O. DIXON, Knoxville.

ent upon USITA in the years ahead than ever before.

Before we take a look at some of the challenges and opportunities ahead of us I would like to refer very briefly to one or two matters which have claimed our attention during the past year.

"That Telephone Excise Tax"

PROMISES come in many forms. Most of them are kept. But a long standing commitment made by Congress again has been unfulfilled and our customers must continue to pay out millions of dollars a year in Federal excise taxes on their local and long distance telephone service.

Much has been written and much has been said about this tax, especially during the last two years. It is discriminatory, being levied only on telephone service, and treats an undeniably vital necessity as a luxury. But the main point is that Congress, through the years, has promised to relieve the American taxpayer of this excise burden and this promise is yet to be kept.

Despite an unprecedented outpouring of public opinion against the tax, despite the fact that many Congressmen voted for repeal and that over 100 bills and amendments were introduced for repeal of the tax last year, despite the fact that the Senate Finance Committee agreed to let the tax die on June 30 of this year — a date voted by Congress last year — despite all this Congress has again reversed its commitment.

"Fiscal responsibility" was the phrase used by Congressmen voting against repeal. It would not be wise, they said, to give up this money-making tax in light of present world conditions and increased government spending. Those voting for repeal cited the fact that it is the telephone customer, not the company, who pays the tax, and that Congress has a legislative responsibility to the public to fulfill its promises.

Whatever the case, the telephone public continues to pay, and pay, and pay.

Our companies and Bell System companies, acting as collection agencies, must continue to take in the excise tax dollars and pass them along to the spenders in Washington. On top of this, our companies will pay their own operating tax bill which can come only from revenues collected from our customers.

So the excise tax is still with us. We lost this round of the battle, but we shall continue to campaign in the interest of justice, urging repeal of the tax on both local and long distance service. Perhaps next year Congress can be induced to find a way to keep its promise.

"Our Exemption Remains But —"

JOINING with other industries which would have been adversely affected, our Association again was in the forefront of the battle against the Kennedy minimum wage bill, which, in addition to increasing the minimum rate of pay, would have seriously diluted our

750-station switchboard operator exemption.

As you know, we won again when Congress adjourned on September 1 without passing any such legislation. That new minimum wage legislation will be presented when Congress reconvenes in January is a foregone conclusion. Interested Independent companies must be prepared again to go to bat at that time. Our Association will continue to keep its membership alerted, but in the intervening months I urge that you continue to bring your views to the attention of your Senators and Representatives — including those who may be elected on November 8 — both in respect to our exemption and to the proposed increase in the basic hourly wage. Meanwhile, I suggest it would be the better part of wisdom for all concerned to accelerate plans for any and all pending dial conversions.

Numerous other legislative matters claimed our attention during the year but the lack of time precludes me from going into further detail. They will be found in Mr. Bailey's report.

At this time of the year when we pause to count our

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Members of this USITA Convention group are (l. to r.): DON CHIODO and VINCENT CHIODO, Tremonton, Utah; EARLE CRANDALL, Pinedale, Wyo.; and DONALD DICKSON, Rupert, Idaho.

Members of this USITA Convention group are (l to r.): F. C. DINGES, Edinburgh, Va.; WARREN B. FRENCH, Jr., Edinburgh, Va., and Mr. and Mrs. JOHN B. NOGGLE, Charlottesville, Va.

Michigan Independents attending the USITA Convention included (l. to r.): CHARLES D. McLELLAN, Lansing; Mr. and Mrs. K. B. SAGE, Central Lake, and R. J. SCHAFER, Pinconning.

Members of this USITA Convention group are (l. to r.): DeWAYNE THOMASON, Middleton, Wis.; M. A. SHEA, Rochester, N. Y., and RAY J. RIORDAN, Madison, Wis.

Shown in this USITA Convention group are (l. to r.): CEASAR F. FIORE, assistant director for mobilization planning Communications Industries Division; ROY F. SMITH, publisher of TE&M, Chicago; and A. J. FALK, director, Communications Industries Division.

Members of this USITA Convention group are (l. to r.): Mr. and Mrs. A. C. KNAPP, Sanger, Calif.; and Mr. and Mrs. L. SEBASTIAN, Kerman.

DOUGLAS S. GLEASON (left), secretary of the Kansas Telephone Association, greets BILL MILLER, secretary of the Iowa Independent Telephone Association.

USITA Director HERMAN HAGEMAN of Lorain, Ohio, (right), meets with ROY F. SMITH, Chicago; and LEON F. ROBERTS, Washington, D. C.

The Independent Telephone Industry

By CLYDE S. BAILEY*

IT IS NOT surprising that the past year should have been one of the most active in the Association's long history. This has been true on the legislative front, on nationwide toll compensation studies, on nationwide communications systems for the military, on matters pending before the Federal Communications Commission, and on many other subjects. In the areas in which the Association's full-time staff and committees have functioned it has had the warm and stimulating cooperation of our Board of Directors, the State Association Secretaries, and many persons connected with individual operating companies.

Included in the membership of our Association, in addition to operating companies in the original 48 states, are now companies in the newest states, Alaska and Hawaii, as well as in Puerto Rico. With Alaska and Hawaii now full-fledged states, Independent companies can boast of furnishing telephone service in five state capitals — Juneau, Alaska; Tallahassee, Fla.; Honolulu, Hawaii; Jefferson City, Mo.; and Lincoln, Neb.

The relative size of the two branches of the telephone industry is shown in the following tabulation:

	Bell System	Independent
Total telephones	60,111,000	10,785,000
Number of operating companies	23	3,560
Number of exchanges	7,050	10,760
Investment in telephone plant	$22,847,768,000	$3,580,369,000
Gross revenues	$ 7,571,536,000	$ 915,189,000
Number of employes	597,100	100,000

The revenues of each of 102 companies now exceed $1 million a year, with the largest company grossing more than $116 million in 1959. More companies are graduating into the million dollar class each year. The smaller companies however will continue to be important parts of the economic and social life of thousands of towns and communities where they continue to provide an essential service.

There are about 133 million telephones in the world, of which 53.3 per cent are in the United States. New records are being made by both Bell and Independent companies each year. The increasing demand for telephone service continues. More customers are being taken on every year. Technological developments are going forward. Direct distance dialing, mechanized toll ticketing, the utilization of radio in its various forms, the growing possibility of the use of satellites high in the sky, and almost myriads of other innovations are con-

Mr. Bailey is executive vice president of the United States Independent Telephone Association, Washington, D. C. This report on the Independent telephone industry was taken from Mr. Bailey's report to the 63rd Annual USITA Convention.

CARLTON APPELO, Deep River, Mich. (left), meets PROCTER HUG, Reno, Nev. (center), and HOWARD S. SMITH, Tonopah, Nev., at the USITA Convention.

TE&M's Camera photographed this group after REA Borrowers' Conference at USITA Convention: (l. to r.): REA Administrator NORMAN H. McFARLIN, EVERETT C. WEITZELL, DAVID A. HAMIL, and ED MADDOX, all of Washington, D. C.

Members of this USITA Convention group are (l. to r.): R. V. ACHATZ, Aurora, Ind.; R. R. HIRSCHMAN, Indianapolis, Ind.; LAMAR STOOPS, Nappanee, Ind.; and USITA Director C. D. EHINGER, Decatur, Ind.

stantly opening new frontiers. They all mean more and better telephone communication for the American people, whose demand for quicker, more comprehensive service seemingly has no bounds.

Conversions to dial operation continue to go forward with rapidity. Whereas 10 years ago only 45 percent of Independent telephones were dial operated, today the figure is more than 85 percent. The percentage of dial phones in the Bell System is 95.7. Independent companies are being encouraged to convert their exchanges to dial operation as fast as possible. This is demanded not only by the needs of the public for improved service but is called for by the growing impact of higher and higher wage costs incurred in manual operation.

Committee reports and addresses to be presented to this convention will provide inspiring evidence of the march of technology in a part of the American economy deemed so important as to have been subject to public regulation by commissions in many states for more than half a century.

The percentage increase in the number of Independent telephones has far outstripped the increase in population. For example, the population increased 39 per cent between 1935 and 1958, but the number of Independent telephones soared 244 per cent.

This is evidence that telephone men and women have been alert to opportunities and recognized their public service responsibilities. The past 15 years, those since the end of World War II, have been ones of fantastic growth. They have been a challenge to the ability and sagacity of management. They have presented an equal challenge to those who have had to engineer, design

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CHARLES R. CASHEL, Worthington, Minn., (left) greets USITA conventioners R. J. SCHAFER, Pinconning, Mich., (center) and DON K. CARLSON, Morenci, Mich.

Members of this USITA Convention group are (l. to r.): LeROY SIEKMEYER, Blair, Neb.; KEITH VOGT, St. Paul, Minn.; HAROLD BOLLINGER, Waconia, Minn. and ERNEST E. STRAND, Chisago City, Minn.

USITA Director KELLEY McNISH of Bristol, Tenn. (left) greets R. H. BURFEIND of Chicago (center) and former USITA President HUGH A. BARNHART of Rochester, Ind. at recent Chicago convention.

Indiana delegates to recent USITA Convention included (l. to r.): GEORGE SCHUMACHER, Indianapolis; ROSCOE PONTIUS, Rochester; JIM SHULTZ, Rochester; L. H. MEYER Fort Wayne; and R. V. ACHATZ, Aurora.

The Great Electronics Future of the Telephone Industry

By DON G. MITCHELL*

**Mr. Mitchell, president of General Telephone & Electronics Corp., New York City, presented this paper at USITA's 1960 convention.*

IN SPEAKING about "The Great Electronics Future of the Telephone Industry," I have in mind the joining together of two great technologies — *telephony and electronics* — to produce a far broader concept of communications. This concept involves far more than simply applying electronic devices and equipment to telephony. It is a case of extending our thinking beyond the traditional forms of telephony and the obvious applications of electronics, and coming up with entirely new ways of meeting the growing and changing needs of our customers.

It goes without saying that all of you are acutely aware of the enormous expansion of the telephone business in recent years because you played a vital role in bringing it about. However, it would be well if I reviewed very briefly the developments leading to the emergence of the electronics industry as we know it today, so we can appraise more effectively its potential contributions to communications.

Several years ago, one of the national magazines described the electronics industry as "the world's most promising technological revolution." Some people in the industry thought this description was a trifle too enthusiastic, but I daresay if you asked each one of them today what their reactions are, they would say that the revolution has indeed occurred. Although it has been of greater magnitude and more successful in some areas of the industry than in others, taken in its entirety, the revolution has been a technological and industrial phenomenon that has never been equaled in modern industrial history. If for no other reason, this description is valid because of the relatively short length of time in which the revolution has occurred.

You don't have to look back very far to trace the development of the electronics industry. As recently as the 1930's, there was no electronics industry as we know it today. Certainly the principle of electronics had been put to good use for a number of years in radio broadcasting, in radio communications, and in the manufacture of radio equipment, but the word "electronics" really did not appear until the early years of World War II.

In fact, you may recall having heard of electronics along about 1942 or 1943 and wondered what the engineers were talking about. The reason a term of this kind became necessary was the fact that the long-since known principle of creating energy through the generation of electrons in a vacuum by applying electricity was being applied to such dramatic new developments as radar, microwave radio, the proximity fuze, electronic gun-firing systems, and many others. Whereas the atomic bomb certainly hastened the end of the war, electronics not only played a major role in the ultimate victory through such equipment as I mentioned but also was invaluable to the atomic bomb project itself.

When you add up all of the scientific and technical developments made during the war, they add up to more technological progress than in the past 20 or 25 years — which is at least some consolation, slight as it was in view of all the lives that were lost and the dam-

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L. A. GUEST (right) of Davenport, Okla., discusses USITA Convention with HUGH STRAUGHN, secretary of the Oklahoma Telephone Association.

Mrs. GORDON BROWN, Enderlin, N. D. (left), meets (l. to r.) Mrs. ELDON W. MILLER, La Grange Park, Ill.; Mrs. HAROLD T. McCAIG, Chicago; Mrs. PAUL STOCKER, Lorain, Ohio and ELDON W. MILLER, La Grange Park, Ill., during the USITA Convention.

Mr. and Mrs. JOHN R. HENNINGER of Butler, Pa. were photographed by the TE&M camera during the USITA Convention.

"Put Them On The Line"

By DAVID A. HAMIL*

Members of this USITA Convention group are: (front row l. to r.): LEONARD NOREEN, Lindstrom, Minn.; KEITH VOGT, St. Paul, Minn., and OSCAR C. LARSON, Center City, Minn.; (back row, l. to r.) ERNEST E. STRAND and LAMBERT J. GREEN, Chisago City, Minn.; and GENE DAUBENDIEK, Jefferson City, Ia.

REA Administrator DAVID A. HAMIL, (center), was photographed by TE&M prior to addressing REA Borrowers' Conference.

WM. C. HARRIS, Lexington, N. C. (left), and R. H. BURFEIND, Chicago, are photographed by the TE&M camera in USITA Convention registration room.

Ten years ago, the U. S. Census figures showed 38.2 percent of the nation's farms with telephones. Today REA estimates that nearly 65 percent of the farms have telephone service.

IF I tell you there are still some households in rural areas that do not have telephones, there will be no ripple of surprise in this meeting room. And if I say that we want to make subscribers out of these people — put them on the line — there will be no argument, I am sure.

The REA rural telephone program has come a long way in the 10 — almost 11 — years since Congress authorized REA to make telephone loans.

During most of this time, our efforts were concentrated on loans and system construction. Now we are turning more time and attention to emphasis on good management and sound operations. This was the expected sequence, the normal pattern, for development of the rural telephone program. First, you get the money and build the system. Then, when you have it completed, your maximum effort is put into getting the best possible use out of it. Construction and operation are never separate, exclusive steps. Many of you are operating a modern dial system now and still building for expanding service. I think this may be the prevailing pattern for some time to come. It is about this stage of the rural telephone program that I want to share some thoughts with you today.

I think most of us in this room are aware of how far we have come in a short period of time. It was only 10 years ago that the U. S. Census figures showed just 38.2 percent of this Nation's farms with telephones of any kind. Today — just a single decade later — our best estimates indicate that close to 65 percent of the farms have telephones — and a much higher percentage of that service is now modern dial.

**Mr. Hamil, administrator of the Rural Electrification Administration, Washington, D. C., presented this address at USITA's 1960 Conference of REA Borrowers.*

RUTH C. DAVIS (left) and ADELLE DAVIS of the Citizens Telephone Co., Bridgman, Mich., attended recent USITA Convention.

Members of this USITA Convention group are (l. to r.): BILL CORMAN, Atmore, Ala.; ROY F. SMITH, Chicago; JANE KELLEY, Chicago; and, AUSTIN N. ELLIOTT, San Mateo, Calif.

Members of this USITA Convention group are (l. to r.): ALICE O'MALLEY, Ambia, Ind.; Mrs. JAMES H. LANHAM and Mrs. ROBERT FINCH, Springfield, Ill.; and Mrs. HERSCHEL TRUMBO, Henderson, Nev.

B. F. ROBEY (left) of the U. S. Air Force, North Highland, Calif., discusses USITA Convention program with (l. to r.): MAYME WORKMAN, executive secretary, Independent Telephone Pioneer Association, and ITPA Assistant Secretary SOPHIA DAVIS of Springfield, Ill.; and W. J. SCHEIDLER of Greensburg, Ind.

This kind of progress is a credit to the entire telephone industry. It reflects a good job being done by REA borrowers, by other Independent companies, and by Bell companies. And in addition, there has been a great advance in service as a result of various segments of the industry working in close harmony.

REA's share in improving and extending telephone service in rural areas has been more than two-thirds of a billion dollars in long-term loans to 711 Independent companies and cooperatives. The actual figure stood at $705,600,000 on September 1. Of this amount, more than half a billion — $519,900,000 — was actually advanced to borrowers for construction and other authorized purposes.

Now, what have these companies and cooperatives done with this much financing? Well, they built nearly 227,000 miles of outside plant. While most of this is conventional pole line, an increasing amount is going underground in buried wire and cable. A very little of

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Illinois Independents attending recent USITA Convention (l. to r.): DELBERT STEELE of Dongola, and W. G. NOBLE and DONALD D. DODSON of Sandoval discuss convention with BERNEY SIMNER, president, Independent Telephone Pioneer Association, St. Louis, Mo.

By B. H. PRYOR*

Communications Network Planning

The telephone industry will soon be faced with the responsibility of handling "machine talk" in much the same fashion that "people talk" is handled today — and "machine talk" or data may be the major part of the industry's future business.

Ohio representatives at the recent USITA Convention included (l. to r.): Mrs. FLORENCE GASKALLA and Mrs. R. I. DUTCH of Elyria.

Visitors to TE&M's exhibit room at the USITA Convention included (l. to r.): FRANK DIXON, Knoxville, Iowa, and BOB WISEMAN, Elkhart, Ind.

H. A. UTECH, Chicago (left), discusses equipment with USITA conventioners (l. to r.): R. A. FIELDS, Fort Walton Beach, Fla.; J. C. GABBARD London, Ky., and W. D. HOLCOMB, Chicago.

TODAY, I would like to set forth a few thoughts, some facts, and perhaps considerable opinion on the planning of communications networks. Before getting into the subject, I think it well to digress somewhat and try to determine just what our communications responsibilities are today and will be in the future.

If it were to be said that the impact of change on the communications business in the last few years has been rather startling, I am sure there would be very few among us who would not agree. This "change" has been more than technological because it has had a very profound effect on our entire business attitude. Being in the business of competing for the consumer dollar has probably left no doubt in our minds as to why our planning must tend to be customer oriented. This, coupled with the fact that we have also recently put considerable emphasis on the point that communications is a word with a rather broad meaning, charges our companies as communications common carriers to provide for the customer that which he desires or needs.

**This paper was presented at USITA's 1960 Engineering Conference. Mr. Pryor is assistant vice pres.-engineering, General Tel. Co. of Calif., Santa Monica.*

Members of this group of Texas delegates to the USITA Convention are (l. to r.): J. B. SWANK of Corsicana and J. C. WINTERS and F. WINTERS of Houston.

Mrs. MAYME WORKMAN Springfield, Ill., Executive Sec'y of the Independent Telephone Pioneer Association, is photographed by TE&M's convention camera.

D. A. (Al) PERIGO, Everett, Wash. (right), visits with GEORGE STEELE, Warsaw, Ind., in TE&M's room at USITA Convention.

USITA conventioners HOUGHTON FURR, Lincoln, Neb. (center), and PAUL HENSON, Kansas City, Mo.

Mrs. LAMAR S. STOOPS (left) of Nappannee, Ind., meets with Mrs. IVAN HEARE of Decatur, Ind., between sessions of recent USITA Convention.

Members of this group of Wisconsin delegates to the USITA Convention are (l. to r.): Mr. and Mrs. RAY RIPP of Cross Plains and Mr. and Mrs. DeWAYNE THOMASON of Middleton.

Technological advances in electronics and the data fields are today promoting change in the entire pattern of customer communications. Rather than thinking in terms of telephones, it is mandatory that we broaden our thoughts to include all forms of communications. You might define our responsibility as the providing of means to permit the exchange of information between any two or more points in a network.

In the area which today is spoken of as the "continent-wide" network and which includes the United States and portions of Canada, facilities exist for service to in excess of 71 million telephones. Of these 71 million, some 50 million are identified with a unique number by which one may be distinguished from any other. To perform the interconnection job necessary, some 20,000 offices are linked into a common network by wire, cable, and radio.

Through changes covering a span of over half a century, a transition has been effected from manual type telephone operation to customer controlled Direct Distance Dialing service as we know it today. This advance is most impressive but the indications are that the greatest challenges from a communications stand-

Please turn to page 108

By D. A. PERIGO*

Commercial Aspects of All-Number Calling

The telephone company's Commercial Department is interested in three aspects of All Number Calling: (1) the directory expense economics; (2) well-instructed employes; and (3) an adequately informed public.

ALL NUMBER CALLING should arouse three points of interest in the Commercial Department. The first is that since Directory Expenses are a Commercial item of control, the economics involved in the decision as to when and how the transition should be made is of primary importance. You will notice the remark was "when and how" which leaves no doubt as to whether it will be used. There seems to be no other answer, at the moment, than to agree that it will be done.

You might be interested in the attitude expressed by the Traffic Committee after a full discussion of the subject a few months ago. I'll quote from that Committee's report to the Board of Directors of U.S.I.T.A.

"The Traffic Committee completely endorses the theory of All Number Calling. It recommends the adoption of ANC at the time of dial conversion or when total number changes are required for equipment reasons. Where 2-5 numbering is already in use this Committee believes that a gradual shift to ANC by using it for new connections is the economic way of accomplishing the result. In all cases this Committee recommends that a sound public relations program be set up to give the public the full story before any changes are made."

In further consideration of the directory economics I would think there would be no question when it is necessary to change all numbers. With the gradual shift from 2-5 by using ANC on all new connections, there does come a time when a decision must be made as to when and how to change the remainder.

The gradual shift will do nothing for the old established business customers. Should they all be done at once or should they be done a few at a time as new directories are published? I feel that this question must be answered by each company, and I further suggest the answer may be different in the various exchanges of the same company.

For example, in the current issue of the Chicago directory a few numbers have been changed — so few it might take a lot of searching to find one — so I'll give you a clue. One of them is the Illinois Bell Telephone Company. I think that gives you another clue also, and that is — by all means make sure the telephone company numbers are the first to be changed.

I believe there are two other Commercial aspects that require attention. One is to inform the public in advance — plenty in advance — and the other is to be sure all employes know the story and what is in back of All Number Calling.

This is where I saved preparation time because the remainder of this talk is one which has been prepared to take care of a large part of these two items. It was prepared for use with employes, Chambers of Commerce, Service Clubs, and schools. Obviously news releases and advertising tie in with the talk.

Newspaper columnists express themselves in many ways. Sometimes a column is informative, sometimes humorous, and often full of innuendos. Probably too often the average reader attaches significance to a column which the columnist never intended. For example, one columnist in discussing All Number Calling said "I think the President should step in and tell the telephone company it can't make the change." Undoubtedly there are people who will remember only that sentence. This is so easy to misquote that unless the telephone company is extremely careful about informing the public, what eventually happens is this:

First subscriber: "I understand the telephone company is going to change all our numbers to seven digits."

Second subscriber: "Don't worry. I saw in the paper where the President told them they can't do it."

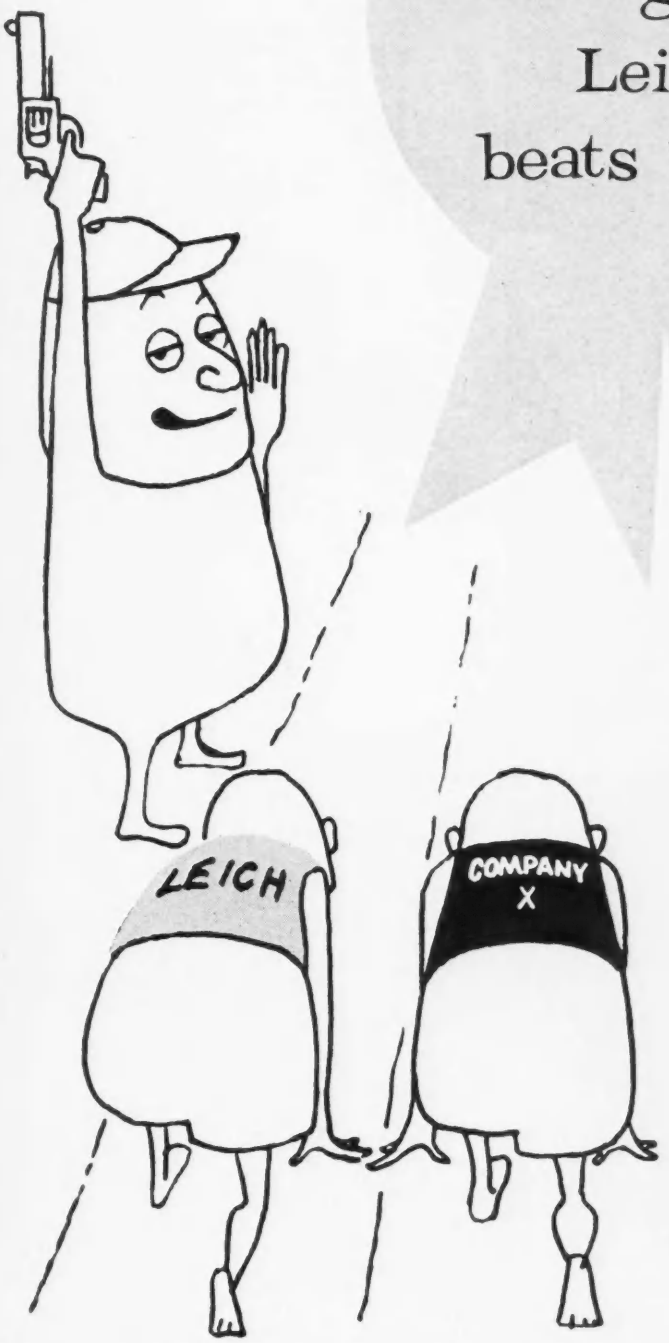
Actually the columnist's entire final paragraph reads this way: — "I think the President should step in and tell the telephone company it can't make the change. It's his business to look after the welfare of the country, and to burden the citizens with seven numbers to remember at a time like this, is to add to the burden.

Please turn to page 102

EDITOR'S NOTE
USITA convention papers not published in this issue will appear in the November issues of TE&M.

**This paper was presented at USITA's 1960 Commercial Conference. Mr. Perigo is general traffic superintendent, West Coast Telephone Co., Everett, Wash.*

When
it comes to
delivering supplies,
Leich
beats 'em all

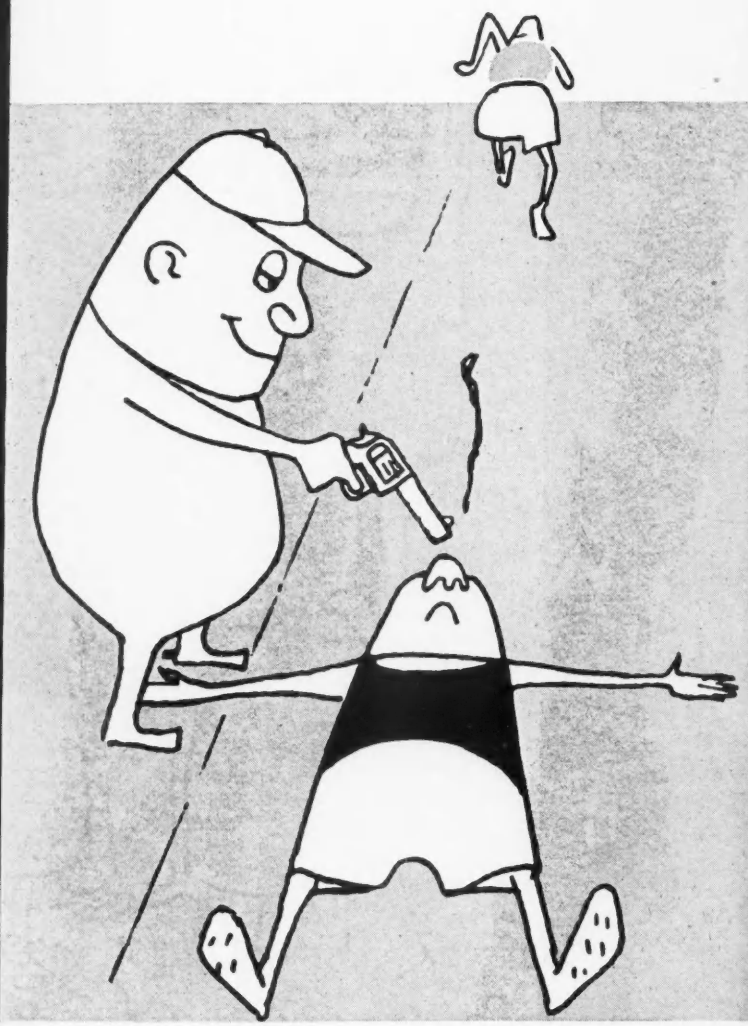


FOR MORE DETAILS, SEE THE NEXT PAGE

All fooling aside, we hold the greatest respect for our major competitors. They are experienced, honest and well renowned in this fabulous telephone business. We just try to merit your business by giving you a little bit better service, a little more understanding cooperation, the little extra help that makes it pleasant and more profitable for you to do business with us.

If this strikes you as an admirable policy, we're glad. If you'd like to try us and see if we are as good as we say we are, we will be tickled pink to have the chance.

We're waiting to hear from you.



LEICH GENERAL SYSTEM

Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

LEICH SALES CORPORATION, 427 W. RANDOLPH ST., CHICAGO 6, ILL.
PACIFIC COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL.
SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS
EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO
SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA

anufacturers of telephones, switchboards and related apparatus since 1907

By J. K. GALLOWAY*

Some Pointers IN MANAGEMENT

By improving your management ability you can (1) run your business and not have your business running you, and (2) make more money and enjoy it.

WE ALL have need for good management, whether we operate large or small companies. Perhaps the small companies have the greatest need, because it is through good management that they grow into big companies. Basically, management is the accomplishing of a planned objective through the use of other people. All of you are managers, but how many of you are good managers? The question is how much can you improve your management. Let's see how.

In order to illustrate, I propose that in this missile age we set the moon as our objective and call it "good management," then build a missile to get us there. So here is our target, and we will call it *good management.* With good management we get more profits, which we all can use, we give good telephone service, and we get expandability.

We all understand *Profits and Good Service,* but let me illustrate expandability. Suppose that when you get back to your office you find that the Air Force is proposing the installation of a missile complex in your service area. Good planning would require that you have explored this possibility and that you have a plan to provide such service. If you have a plan that can be implemented you are a good manager.

Suppose you get word that an industrial plant is to be built in your service area which when completed will employ some 1,000 people. This could come as quite a jolt. If you have a plan to obtain the money and a plan to design and construct the required facilities, you are a good manager. If you don't have a plan, you should start developing one now.

We can then conclude that planning is one of the basic principles of good management. So let's call the flame of our missile *planning.* The flame of the missile provides the thrust to get the missile off the ground. Now let us talk about planning for a minute. In addition to the illustrations I have just given you, we also need a stated company policy — a basic policy. That policy should state in general terms what your company proposes to accomplish.

For example, your company is organized to furnish good telephone service — good telephone service at the least possible cost to the public — but there is some more — and we add commensurate with sound financial policy. Now, we have as a first objective of the company — to offer the public the most modern and efficient telephone service possible, commensurate with sound financial principles. You gentlemen are managers and can develop this to suit your individual needs. A typical set of company objectives which make up company policy is shown in *Exhibit One.* This company policy should be given to all your people and a detailed explanation given each employe so that it can be understood. Planning also facilitates decision making and develops creativeness, all within the framework of company policy.

Organizing People

AFTER the missile is off the ground, the first stage takes over and propels it further toward our objective. So let's call this first stage of our missile *organization.* Remember now, you are organizing people, and in order to get people to do what you want them to do, you must tell them. If you have some hazy idea what you want to accomplish, you can hardly tell your people what to do or when to do it. In organizing people you must tell them clearly what their duties are and authorize them to exercise the authority necessary for them to complete the assignment.

So a set of duties and responsibilities for each of your people is necessary. These should be in writing. I will illustrate: Suppose you instruct your plant superintendent to maintain good service. One of your customers comes to you and complains his telephone has been out of order over a week. You call your plant manager and say, "Jim, what happened to our subscriber's service?" He says, "That was cable trouble, and I couldn't get the cable splicer on the job sooner than yesterday. He was working on a new cable we are installing."

You say, "Jim, I told you to do the necessary to get that cable restored to service." Jim says, "I didn't understand that." The point is if you have written duties and

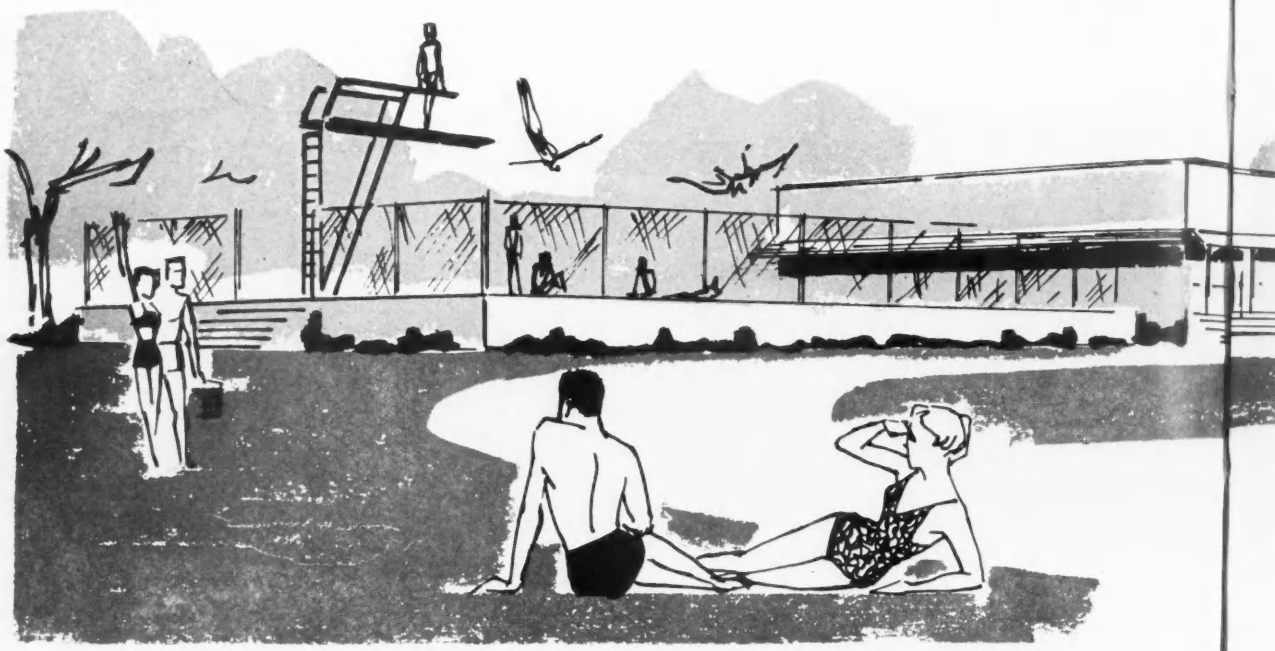
Mr. Galloway, president of the Winter Park (Fla.) Telephone Co., presented this paper at USITA's 1960 Conference of REA Borrowers.

LEICH

LINE CONCENTRATOR

PROFITABLE USES

Saves $15,550 i



Imagine! A unit that saved $15,550 while serving a growing resort area.

That's exactly what Leich's Line Concentrator did by cutting outside plant costs. Instead of serving each line over a separate wire pair, it concentrates a number of subscriber lines over a much smaller "high usage" trunk group.

The cost-cutting story: This resort area was growing quickly and service requirements were expected to double within 5 years. A 26 pair cable served the area which was about 5 miles from the central office. Four pairs were used along the route to the area and the remaining 22 gave party-line service to 110 stations.

To handle new subscribers, a 49-9-2AX Leich Line Concentrator was installed. It extended 49 subscriber lines over only 11 pairs for a net gain of 38 lines. Another Concentrator could be added on the remaining 11 pairs as the area grew.

The cost of the complete installation was only $4,450, including a weatherproof cabinet for mounting the Concentrator's subscriber unit. The alternate choice of cable relief would have cost about $20,000. It would mean adding a 51 pair cable for 4½ miles and removing the 26 pair, or putting up a parallel 26 pair on a new messenger.

Savings from use of the Concentrator: $15,550!

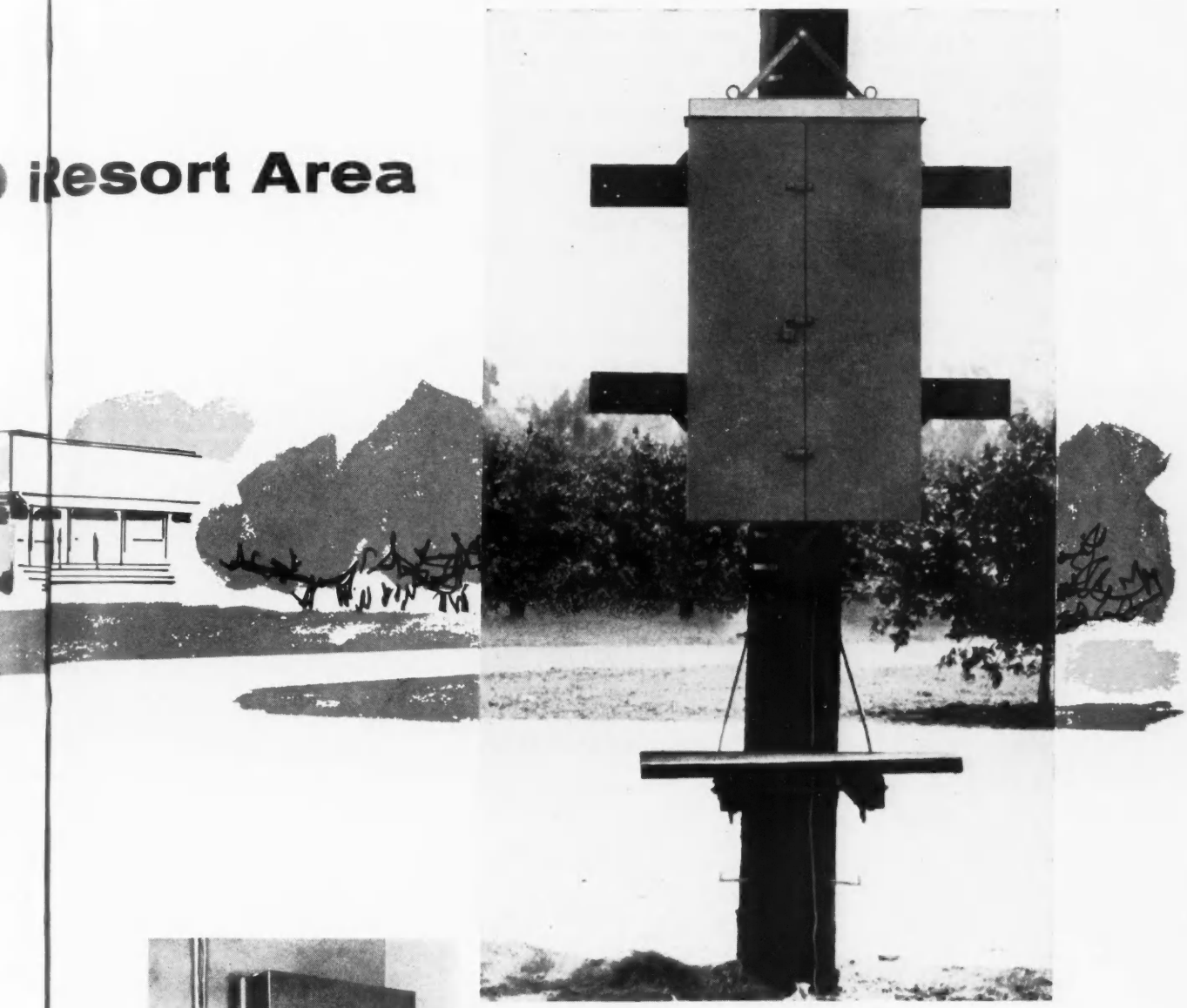
LEICH

GENERAL SYSTEM

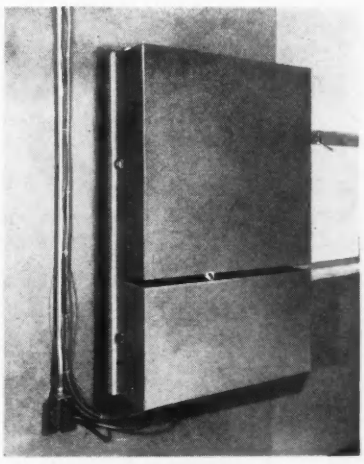
Subsidiary of

GENERAL TELEPHONE & ELECTRONICS

Resort Area



SUBSCRIBER UNIT



EXCHANGE UNIT

Write for Brochure of Line Concentrator Facts and Applications.

LEICH SALES CORPORATION • 427 WEST RANDOLPH STREET • CHICAGO 6, ILLINOIS

PACIFIC COAST: 11401 W. PICO BLVD., LOS ANGELES 64, CAL.
EAST: 3651 CONNECTICUT AVENUE, YOUNGSTOWN, OHIO
SOUTHWEST: 1227 SLOCUM STREET, DALLAS 7, TEXAS
SOUTHEAST: 5126 SOUTH LOIS ST., TAMPA 11, FLORIDA

manufacturers of telephones, switchboards and related apparatus since 1907

responsibilities, you can call Jim and say, "Jim, why haven't you been doing the job assigned? Here it is in your duties and responsibilities, you are responsible for this."

People forget important things about their jobs, so as the manager it is your responsibility to have those duties in writing so you and Jim can refer to them and see what is required. This is important, and will be of great help to you in being a good manager. You should have a company organization plan showing who reports to who and also showing the lines of authority.

EXHIBIT ONE: Basic Company Operating Policy.

(1) To offer the public the most modern and efficient telephone service possible commensurate with sound financial principles.

(2) To provide telephone facilities on a ready-to-serve basis within the limits of reasonable forecasting, engineering and sound financial principles.

(3) To maintain as reliable a service as possible, commensurate with the public need and the ability of the public to pay for such service.

(4) To have authorized rates and charges for telephone service which will make such service available to the public at the lowest possible cost in keeping with sound financial principles.

(5) To maintain all records of the company, particularly financial records, by uniform standards as prescribed by your regulatory commission, through the application of efficient and modern practices and in such detail as will enable officials of the company, its stockholders and the public, where required, to be adequately informed as to the company operations.

(6) To be ever mindful of the fact that the company is a public service corporation, and that no favoritism can be shown to any individual or corporation in furnishing telephone service, except where the public interest dictates otherwise.

(7) To insure maintenance of company credit, the company will undertake no project until its complete cost is determined, funds are available and the income from such project will warrant the investment.

(8) To insure company employes the best possible working conditions, maximum security and an adequate living wage compatible with area living conditions.

(9) To maintain adequate training facilities that each employe may have opportunity for self-improvement and advancement.

(10) To promote employes from within the ranks of the company whenever possible.

(11) To encourage the participation of company personnel in those community projects which have for their purpose the economic, social, religious and cultural advancement of the community.

The Training Program

IN ORDER to have your organization function, you must have a training program. There are many sources of training material of a technical nature and of a general nature. This is important — remember we must train our people so they can accept more responsibility, so they can act with more authority, so we can pay them more money.

There is an art in supervising people. One of the reasons we have unions is because we have not supervised our people properly. Let me illustrate: The day has gone when we can call a good installer in and say, "John, you are a good installer. You are now promoted to supervisor of installation. Put your hat on the other side of your head and act like a supervisor."

Poor John. Sure, he can install telephones himself, but he now is a manager. He must install telephones through other people. You haven't been fair to him when you haven't given him training in supervision. I have seen a lot of people that were experts who when made supervisors fell flat on their faces. Why? They don't know how to teach and supervise other people.

To illustrate, we had a man who was made testboard supervisor. He struggled for a long time. He was unhappy in his job, and the section was not performing. In short, the job was not being done. We sent him to two schools — one on supervision and one on job methods. He was a good student, he learned a lot — our initial selection was good because he had the aptitudes for the job assigned. Within weeks he had his section completely organized. The job was being done. He was happy in his work. In fact, he was running his job — his job was no longer running him.

For you managers the USITA has an excellent Management Development Program at the University of Kansas. Every company represented at the USITA convention should see that one of its top management people attend. The cost is small compared to the benefits you will receive, and the benefits will be useful for years to come. In addition, the USITA sponsors an engineering course at Michigan State which is available to your technical people. Next year there will also be a one-day seminar on merchandising at Michigan State. The REA Regional Seminars on Plant, Commercial and Accounting are excellent. Your people should attend.

To assist you, *Exhibits Two* and *Three* list training material available to you. Read them and make some of these courses available to your people.

Motivation

THE FLAME and first stage of our missile get us on the way, but there is a second stage which takes us high in the stratosphere. For our good management missile we will call the second stage *motivation*. This is getting other people to do the things that we want them to do.

All of you have read Dale Carnegie's book on "How To Win Friends and Influence People." This is a good starting place. We are not like the Russians. We can't give orders and if they are not carried out send the culprit to Siberia. We can stop his pay, but that is expensive for us and for the culprit.

Let's recognize the fact that most of our people want to do a good job.

EXHIBIT TWO: Available Training Aids, Training Programs, and Training Material.

(1) Supervisory Training Courses Available From State of Florida, Department of Education, Tallahassee. Contact: Dr. Charles R. Crumpton, State Coordinator, Supervisory Training.

1. Harvard University Reading Course
2. Safety Management for Foremen
3. Human Factors in Safety
4. Psychology of Safety in Supervision
5. Supervisory Leadership Training in Fundamentals of Supervision
6. Instructor Training for Supervisory Personnel
7. Human Relations Training for Supervisory Personnel
8. Effective Speaking for Supervisory Personnel
9. Conference Leadership Training for Supervisory Personnel
10. Job Instructor Training
11. Human Relations in Industry
12. Human Relations in Hospitals
13. Improving Job Methods
14. The Supervisor as an Instructor
15. Problems in Handling People
16. The Supervisors' Part in Safety
17. Principles of Organization and Management
18. Management Techniques for Foremen
19. Practical Supervision
20. The Techniques of Supervision
21. Supervising People
22. Effective Supervision
23. Elements of Supervision
24. Management Training, Cases and Principles
25. Motivation and Resistance to Change
26. Psychology in Industry
27. Human Relations in Supervision
28. Human Relations in Industry
29. Better Business Communications
30. Handling Barriers in Communications
31. How to Talk More Effectively
32. Communication in Management
33. Psychology of Industrial Relations
34. Human Relations in Action
35. Influencing Employe Behavior
36. Principles of Management
37. Top Management Organization and Control
38. Human Behavior in Industry
39. Conference Leadership
40. Economics, Principles and Applications
41. Basics of Supervision
42. Job Instruction Techniques
43. Group Discussion Techniques
44. Leadership Training
45. Effective Speaking
46. Letter Writing
47. Speed Reading
48. Basic Economics
49. Basic Sales
50. Management Courses for Air Force Supervisors, Civilian and Military
51. Introduction to Supervision
52. Principles of Work Management
53. Supervisory Development Program
54. Techniques of Supervising People
55. Job Relations Training Manual
56. Job Instruction Training Manual
57. Job Methods Training
58. Program Development
59. Using Job Instruction Training
60. Union Job Relations Training Manual
61. Training Course in Material Handling
62. Industrial First Aid Training
63. Communications in Business and Industry
64. Conference Leadership Training
65. Economics Training
66. Effective Job Organization
67. Problems in Business Management
68. Waste Reduction
69. Machinery Manufacturing Cost Accounting
70. Fundamentals of Management
71. Communication
72. Communications of Ideas and Ideals
73. Human Relations in Supervision A and B
74. Supervisory Problems in the Plant
75. Case Problems in Business and Industrial Management
76. Secrets of Job Success
77. Secrets of Successful Leadership
78. Human Relations Cases
79. Cases on Human Relations in Business
80. Cases on Human Relations in Management
81. Conference Leadership
82. Job Relations Training — Case Studies
83. Principles of Human Relations
84. Conference Leadership in Business and Industry
85. Departmental Personnel Procedures
86. Examining the Will to Work
87. Straight from the Horse's Mouth
88. Your Attitude Is Showing
89. Guide for Conference Leadership, Supervisory Topics
90. Guide for Conference Leadership, Safety Topics
91. Case Problems in Personnel Management
92. Filmstrips Management and Supervisory Training Programs
93. Charts for Economics Training
94. Management and Supervisory Training Charts
95. Guide for Conference Leadership
96. Successful Conference and Discussion Techniques
97. How to Be a Successful Leader
98. Management and the Worker
99. Developing Management Ability
100. Developing People in Industry
101. Psychology for Life Adjustment
102. Sizing Up People
103. How Our Business System Operates
104. Guide for Management Trainers
105. Management Training for Small Businesses
106. The Management Process
107. Program for Supervisors' Development in the Army Establishment
108. Guide for Supervisors' Development in the Department of the Army
109. Supervisors' Guide to Job Instruction
110. Planned Promotion Programs
111. Modification of Jobs for Better Utilization of Manpower
112. Promoting the Will to Work
113. Performance, Appraisal and You
114. Guide for Conference Leadership
115. Supervisory Development Program
116. Discussion Leadership
117. New Foreman Training Plan
118. Selection and Training of Foremen
119. Management Development Programs for Executives and Supervisors and a Manufacturing Division
120. The Responsibility of the Training Supervisor
121. Induction Training
122. Production Training
123. Preparation of Training Course Outlines
124. How to Select New Supervisors
125. Techniques of Day-To-Day Supervisor
126. Job Methods for Supervisory Personnel
127. Extemporaneous Talk for Industrial Supervisors
128. Business Letter Writing for Industrial Supervisors
129. Supervisory Development Program

Supplementary material, including Instructors' Manual, pass-out sheets, and, in some cases, films, is available with the majority of the above training programs.

A manual giving a brief description of each of these courses will be published some time in the first quarter of 1961.

Requests for any of this material should be directed to Dr. Charles R. Crumpton, State Coordinator of Supervisory Training, Department of Vocational and Adult Education, Tallahassee, Florida.

Similar extensive adult training programs are in effect in a number of other states. Principally, the states of Ohio and Texas have excellent programs which have been in operation for a number of years. Information and material can be obtained normally from these and other states usually by contacting the agencies responsible for Public Adult Education. Although it is not true in all cases, the State Department of Education generally is the agency responsible for handling of this type of program.

Our job is to create a desire in our people to learn more so we can pay them more. That is the place to start.

Now let's tell them what is going on in the company. To illustrate, most line crew foremen are not very good supervisors, because we have not taught them to be. If a line crew foreman would stop for five or 10 minutes each morning and outline for his men the jobs to be accomplished during the day, and give a little information as to what would be accomplished for the company, his crew would work harder and do a better job. Try it and see how it works.

Communication is a great thing. Most of us dislike work, but we have to work to eat. But if we know what we are accomplishing by our efforts, we will work with more enthusiasm, do a better job and get more done. Don't forget, as managers we must inspire our people to do the job that must be done.

In motivating people, we must be fair and honest in our dealings with our people. Integrity is honored and respected by all our people.

Another tool of management is employe evaluation. All our people want to know how they are doing. Many of us find it difficult to correct and at the same time explain how. One of the reasons that is so difficult is that we must know how before we can explain how. You will find that an organized plan for regular evaluation of your people will greatly improve your whole organization. This is done by you for the supervisors and by the supervisors for each of their people. Tell them where they are good and tell them where they can improve.

Let's remember that by reviewing company operations for your department heads, and having your department heads review company operations with your supervisors, and so on to inform your least employes of company problems and solutions, you will create a management team that will surprise you.

EXHIBIT THREE: Available Training Aids, Training Programs, and Training Material. (Continued from Exhibit Two.)

(2) Bibliography For Supervisory And Leadership Training. This can be secured from Doctor Charles R. Crumpton, State Coordinator of Supervisory Training, Department of Vocational Adult Education, Tallahassee, Florida.

(3) Educational material, films and books on Supervisory and Management Training may be obtained from such publishing companies as The McGraw-Hill Book Co., Inc., 1330 West 42 St., New York 36, N. Y.; The Dartnell Corp., 4660 Ravenswood Ave., Chicago, Ill.; Prentice-Hall, Inc., Englewood Cliffs, New Jersey; BNA, Inc., 1231 24 St., Northwest, Washington 7, D. C.; The National Foremen's Institute, Inc., Deepriver, Conn.; The International Correspondence School, Scranton 15, Pa.; Alexander Hamilton Institute, Inc., 71 West 23 Street, New York 10, N. Y.; The American Management Association, Inc., 1515 Broadway, New York 36, N. Y.

(4) The various Bell System Companies and the General Telephone and Electronics Company.

(5) Various business magazines, including those which pertain directly to the telephone industry as well as other industries. Examples include: Telephone Engineer and Management, Telephony, Nation's Business, United States News and World Report, Business Week, etc.

(6) Trade Associations including, The American Society of Safety Engineers, The American Society of Training Directors, Personnel Associations, National Secretaries Association, Management and Industrial Groups and Associations, etc.

(7) The Southern Technical Institute, Chamblee, Georgia. (This school is a unit of the Engineering Extension Division of Georgia Institute of Technology and provides well-trained telephone central office, traffic and plant technicians and engineers.)

(8) The United States Independent Telephone Association Management Development Program for Independent Telephone Executives, Kansas University, Lawrence, Kansas.

(9) Various State Universities and Colleges in your company's area. This includes Junior Colleges, County Vocational Schools, High Schools and Privately Endowed Colleges.

(10) The Public Utility Executive Program held annually at the University of Michigan, School of Business Administration.

(11) The Telephone Engineering Conference held annually at Michigan State University, East Lansing, Michigan.

(12) Management Conferences held at Cornell University, Ithaca, New York.

(13) The Public Utility Reports Guide (a Correspondence Home Study course for the Utility Executives, 322 Pennsylvania Building, Washington 4, D. C.).

(14) Superintendent of Documents, Washington 25, D. C.

(15) A great deal of valuable training information and training aids can be secured through the government, by simply requesting to be placed on the mailing list of State Announcement of Government Publications. An example of training programs that can be secured from the government includes the Management Course for Air Force Supervisors, which includes training outlines on Management and Supervisory problems and their solutions.

The above is only a partial list of sources of training information and material which may prove of value to your company.

Management Control

OUR MANAGEMENT missile is now on its way, but the purpose of this shot is to hit the target — *Good Management*. The nose cone on our real missile has all the instruments, so we will call the nose cone of our management missile *control*, to represent the control you as managers must use in the operation of your business.

You must follow the REA construction standards, a control imposed on you for your benefit by REA. You must maintain good accounting records. Those records are useful to you on a monthly basis and should be available to you each month for you to see how you are doing and how you can improve the efficiency of your operation.

Do you prepare an operating budget each year showing your estimated income and expenses and compare it each month to see how you are doing? This could help you immensely in the control you must use in your operation. Do you prepare a capital expenditure budget for the year ahead and compare that budget each month

with actual expenditures? This can help keep your cash position so you can be assured of maintaining your credit.

Compare your operations on a per-station basis with the operations of other companies. This can tell you how you are doing as a manager, and will point up ways you can be a better manager.

Each of you should report your operations to the Washington office of the USITA so that you can be included in the Statistical Manual.

Our missiles that are fired from Cape Canaveral have fins which furnish strength and help keep the missile together as well as to stabilize it. So we will call the stabilizers on our management missile *coordination*, because it is through coordination that we can bring our management missile to its target — *Good Management*.

We have made plans, so we know where we are going; we know our objective and we have our organization — so we know who reports to who, and who is to do what. We have established communication within our organization so that our people know why they are doing their job; in short, our people are working together.

You as the manager must see that this coordination is perfected every day. Test it. How many times does your installer have to wait for a pair assignment, or maybe install the telephone and it will not work until the next day because of lack of central office coordination? Can your commercial office personnel tell the applicant for service that his phone will be installed at 10:00 tomorrow? Or do you tell him we will install his phone next week? These are questions you can ask yourself — you the manager — and see how well managed your company is — how good a job you are doing. Don't forget, and this is very important — all you have to sell is service.

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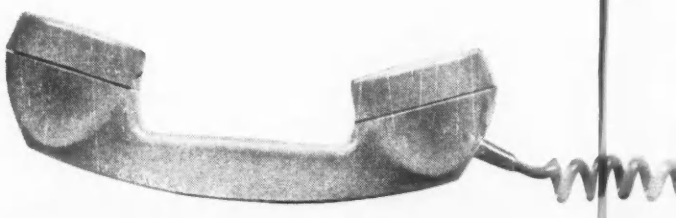

1573-W: (Above) Use it two ways and reap the profits! It provides two-line service plus intercom, with Hold on each line. Or, with a simple adapter, it's a three-line telephone with Hold on each line, without intercom.

1553-W: (Right) The ideal telephone for many, many applications: in kitchen, den, halls, workrooms—just about anywhere in the home. Great for your business subscribers, too—especially where space is a problem. Its slim, trim design gives it tremendous versatility.

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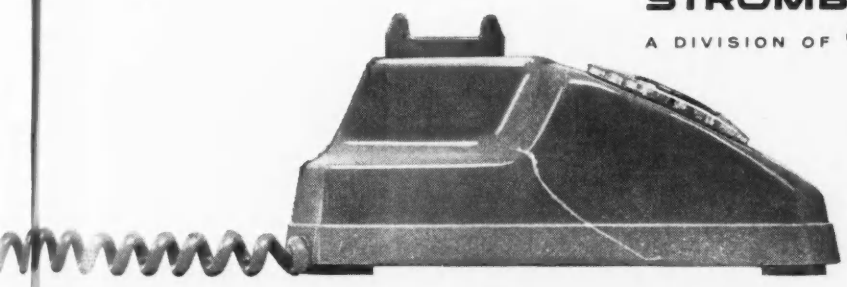

1543-W: It's handsome, compact, styled with snap and sparkle. This telephone is engineered for high fidelity of voice transmission, for ruggedness, for true full-range performance. Lightweight handset, of course.

FIGURE ONE.

FIGURE TWO.

Principles of Resistance Design

By ROBERT H. DAVIS*

The desirable characteristics of resistance design eliminate the tedious transmission studies made by many telephone companies to determine the adequacy of transmission on local loop additions.

WITH the improved transmission made available by the use of the latest modern telephone sets, plant extension engineers can now reliably design local subscribers' loops on a strictly resistance basis. The tedious transmission studies, made by many telephone companies, to determine the adequacy of transmission on local loop additions have become an art of the past.

Resistance design is dependent on three basic fundamentals. They are: (1) The allowable loop resistance limit is controlled by the signaling limit of the central office equipment (in most cases 1200 ohms); (2) subscriber station instruments with at least the equivalent transmission qualities of the 500 type instrument must be installed on all loops exceeding approximately 700 ohms; and, (3) all cable loops over 18,000 feet must be loaded. If we do not violate any of these three basic design fundamentals, we can be assured our transmission limit will extend far beyond our signaling limit.

Resistance design is the preferred method to be used in a plant addition, because this method permits the plant engineer to make the most efficient use of existing cables, and utilizes the smaller gauge cables in areas where the greatest economy is to be realized. The reduced engineering time required is of major importance to all telephone companies. Adoption of the procedures used in resistance design will produce a plant with a high grade of average transmission efficiency, and will be acceptable to the public for the foreseeable future.

Special consideration must be given to PBX trunks where the loop resistance must include the PBX trunk equipment and the station loop. Here too, the battery feed relay may be located at the PBX, thus limiting any benefit to be received from a 500 type instrument. Pay station equipment also requires special consideration since it seldom functions properly on loops exceeding 900 ohms, unless equipped with a long line adapter circuit. It would be unusual to have a concentration of pay telephones in an area of such magnitiude to affect the selection of the cable gauges.

Two Layouts Needed

IN PRACTICE the Resistance Method requires the engineer to lay out both a *theoretical design* and a *proposed design* for the plant addition under consideration. The selection of cable gauges, loading point, and change out point, for the improved telephone sets, is taken from the theoretical design and incorporated into the proposed design.

Please turn to page 66

Mr. Davis presented this paper at USITA's 1960 Plant Conference. Mr. Davis is equipment engineer, Telephone Service, Inc., Lima, Ohio.

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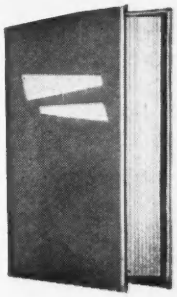
—for more complete, accurate analysis



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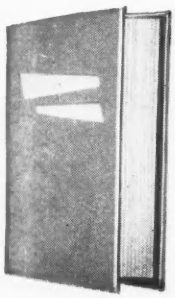

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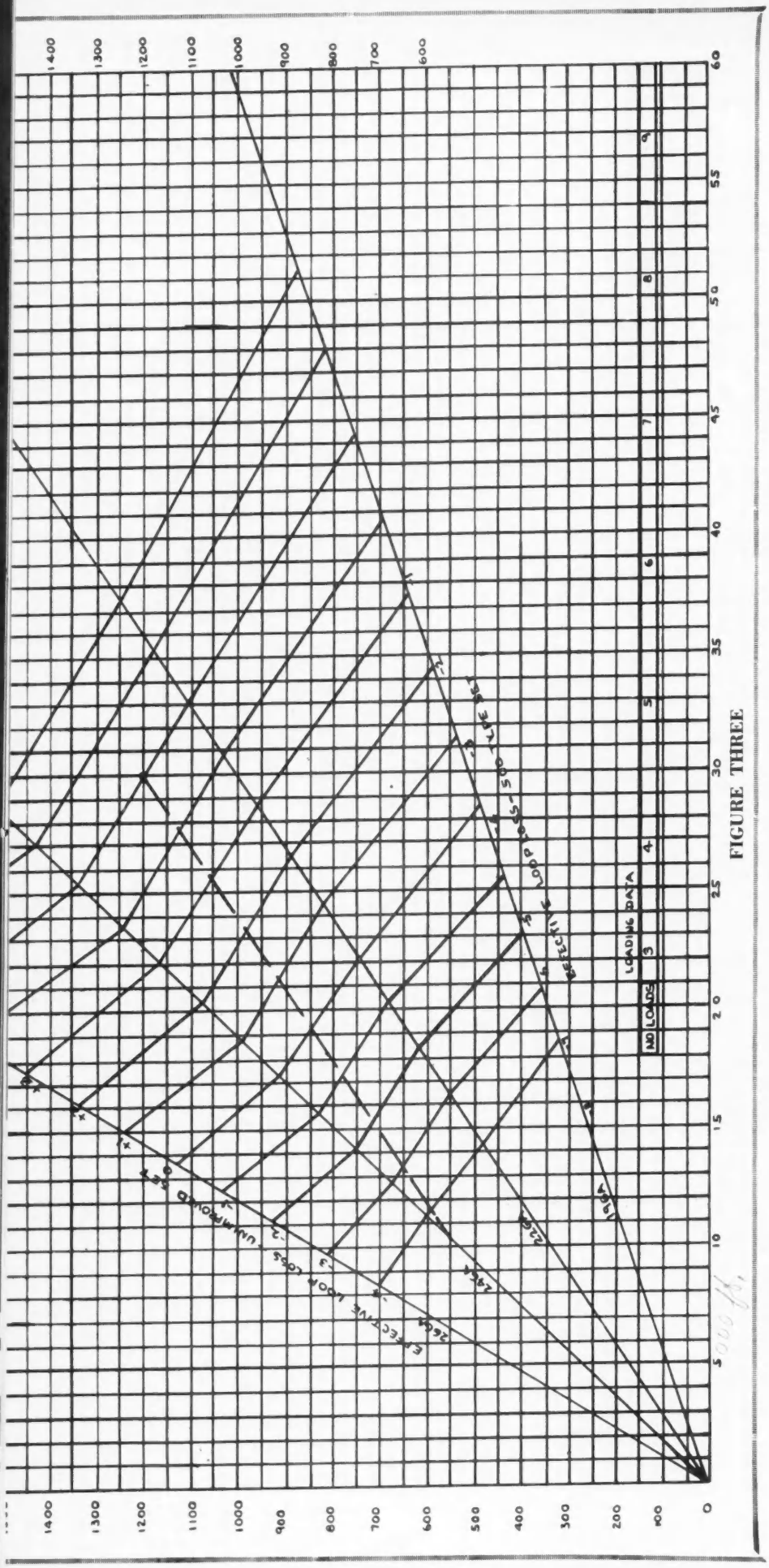

FIGURE THREE

(Continued from page 64)

In laying out the theoretical design all existing cable gauges are ignored. The cables selected to be used in the theoretical layout are the two smallest consecutive gauges which will not exceed the office signaling limit when shown in their ultimate length. The theoretical design must take into consideration all future extensions, additions, etc. which could affect this layout.

Where open wire is under consideration for an extension, it will require further engineering judgement. The economy of installing the open wire now, weighed against the cost of the selected cable gauges and the future loop requirements in the area, will be the determining factors. However, if the theoretical layout specified a particular cable gauge, open wire could be utilized on the far end of any layout without troublesome results.

Let us consider a small cable extension installed several months ago in Bucyrus, Ohio, and the functions required to plan this extension using the Resistance Design Method. The make-up of the cable is as shown in *Figure One.*

It has been determined that a 50-pair extension at Section D, 5000 feet in length, and a 25-pair extension at Section E, 1200 feet in length, are required. To determine the size cable required for this addition, we must design a theoretical layout. As previously mentioned, the cable gauges selected for this layout will be the two smallest consecutive gauges which will not exceed the central office signaling limit of 1200 ohms.

The theoretical design layout should look like the example shown in *Figure Two.* The ultimate length of this cable has been predetermined to be 30,243 feet, point U on the theoretical layout and the actual layout.

All of the engineering data required to obtain a theoretical resistance design should be obtained from design charts similar to the one shown in *Figure Three.* These charts are an invaluable aid to the plant extension engineer.

The charts are scaled vertically, on each side, in loop resistance and hor-

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izontally across the bottom and top of the chart in kilofeet. To determine the two smallest cable gauges we can successfully use in our theoretical design layout, locate the 1200 ohm line on the vertical scale (central office signaling limit) and the 30 kilofeet line on the horizontal scale.

These two lines intersect at a point in between the 24-gauge and 22-gauge cables. Since the cables with the greatest number of pairs are always nearest the central office, these cables, for economic reasons, should be the smallest gauge. Therefore, Section A of our theoretical design specifies 24 GA and Section B specifies 22 GA.

To determine how many kilofeet of each gauge may be installed, draw a line parallel to the line representing the *largest* of the two gauges. This line begins at the point where the 30 kilofeet intersected with the 1200-ohm central office signaling limit. The point where this parallel line meets the smaller of the two cable gauges is the separation point for the two.

In *Figure Three* this line (shown as dotted line) intersects the 24 gauge at approximately 10 kilofeet. Assuming the C.O. at 0 kilofeet, we can install approximately 10 kilofeet of 24-gauge and the balance of our ultimate length in 22-gauge. Thus Section A of *Figure Two* becomes 10,000 feet of 24 GA and Section B specifies 20,243 feet of 22 GA.

In the actual layout (*Figure One*) we have only 2,883 feet of 24 GA. The theoretical design indicates we could install up to 10 kilofeet of this gauge cable. Since the permitted length of smaller gauge has not been exceeded, we can adopt the cable specified in the theoretical layout for the cable extension to be made. Therefore, Sections D and E of *Figure One* would be 22 gauge.

At this point, the question usually arises, "If in this layout, we can install up to 10 kilofeet of 24 gauge, why shouldn't the extension be made with this smaller cable?" The question is well founded, since some economy could be realized. However, this would prevent us from establishing the full 10 kilofeet of 24-gauge cable

Please turn to page 85

Engineering Considerations

In Planning Central Office Locations

By CARL HANENBURG*

Selection of a central office location is based on the needs of the Commercial, Traffic and Plant departments, and may involve matters ranging from public relations to adequate parking space.

AT THE OUTSET it should be made clear that the selection of a central office location always involves other than pure engineering considerations. The decision is based in most instances on a combination of the needs of the Commercial, Traffic and Plant departments, which may involve matters ranging from public relations to space for relocation of personnel or from toll switchboard space to adequate parking space. Processes have varied with time and the individual companies ranging from a simple division of the area geographically to complex calculations of wire centers based on forecasted estimates of industrial and residential growth over certain specified study periods up to and including the ultimate saturation of the area. For our purposes here, however, we will deal with the basic problems of the economic selection of a central office location as related to plant costs.

The obvious point of beginning is in having the best forecast of customer demand available or, more commonly, the commercial survey. Here it is essential that forecasts be made in increments not to exceed five years to establish the economic time interval for placement on an annual charge to investment basis. This will vary depending on the size and growth of the areas involved. For example, an area where rapid growth is being experienced and it is conceivable that complete saturation can be anticipated in an interval of, say, 10 years, it is no longer a matter of complex study to determine either location or size since simple economy would necessitate providing for the ultimate size in major units such as buildings, underground conduit systems and, even to some extent, backbone cables.

More common to many of our operations, however, is the situation where growth has been somewhat uniform although confined to certain concentrated areas and existing facilities are exhausted in both central office equipment and outside plant. Frequently the growth areas are on exchange fringes where transmission resistance design is becoming a problem. So a new factor of cost comparison is introduced: Should we pay the additional penalty in heavier gauging of wire circuits or should we consider a relief community dial

Please turn to page 72

Mr. Hanenburg, general plant engineer of the West Coast Telephone Co., Everett, Wash., presented this paper at USITA's 1960 Engineering Conference.

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(Continued from page 69)
office encompassing part of the exchange area and/or areas of two or more contiguous exchanges?

Consulting the commercial survey will provide the basic answer as to the magnitude of the growth and the forecasted cost of outside plant expansion required can then be calculated. This will be weighed against the long range forecast for this area and the net cost comparison of the establishment of the community dial office.

At this point it should be re-emphasized that problems other than engineering have been resolved. In this reference is meant what effect such matters as exchange boundary relocations, extended area service calling options and direct distance dialing will have on customer opinion.

Accurate Survey of Calling Patterns

HAVING ESTABLISHED that an exchange should be installed based on preliminary cost estimates, it follows that an accurate survey of calling patterns is essential to provide adequate trunking facilities. This, while being a part of the preliminary estimate, becomes important in integrating existing cable facilities for trunking purposes. This survey can also materially influence the type and quantities of central office equipment initially installed.

In selecting the community dial office location, then, the practical approach is to consider (1) forecast requirements on five-year intervals, (2) maximum use of existing facilities and application to the best advantage, (3) immediate relief requirements in existing offices, (4) distribution cable relief projects to provide primary service to rapid development areas, (5) optimum gauge benefits as related to extending the minimum of expensive heavy gauge circuits and maximum large size light gauge cables.

Taking these points in order let's consider first the area survey for future service demand. The people making the survey should if possible be experienced in the telephone field — preferably a happy combination of realists with vision and a pronounced tendency toward being practical. They should have their feet on the ground but at the same time not inclined to be over conservative. Information on growth patterns should be objectively weighed and corroborated by sources other than developers on a promotional basis. Planning commissions, school district growth forecasts, population research statistics by university survey groups, are normally considered reliable sources of information.

The economic reuse of existing facilities is an essential part of locating central offices. Generally speaking it follows that an appropriate location will be in proximity to an established feeder cable route. This again will fall near the established wire center in a properly designed plant. It is frequently possible to make use of existing cables for trunking facilities as well as exchange circuits. This can provide advantageous use of heavier gauge cable that will be inherent in fringe area plant design. It should be recognized that existing wire centers based on present distribution of subscribers may differ from locations plotted on the basis of projected growth estimates. This of course must be weighed against the estimated time element involved in the wire center shift. Some variation from final wire center selection must be anticipated due to the problem of availability of property at the selected site.

The need for a second office is frequently precipitated by the exhaust of space and/or switching equipment at an existing office or offices serving adjacent exchanges. The location may be varied to a theoretical wire center so placed to advantageously relieve the existing primary central office where additional cost would be greater and immediate action must be taken to provide additional facilities.

Addition to central office facilities and buildings under a given set of circumstances can be more costly on an annual charge basis than concentrating all switching equipment in a single new exchange building at a centralized location. When in the customer location forecast rapid development is anticipated in certain concentrated areas, it is only sensible to plan distribution cable plant to adequately serve this area in the initial plant to be constructed.

As it is generally necessary during the planning, engineering and construction stages of projects of this magnitude to provide interim service in congested and rapidly developing areas, it should be emphasized that plant be engineered with the objective of integration with a new community dial office location. It follows that these projects will be based on normal engineering practices in providing growth margins in the immediate distribution areas and only sufficient feeder facilities to the existing central office to last until the scheduled in-service date for the new dial office.

The reference to optimum gauge benefits in cable extensions specifically entails balancing the forecasted concentration of subscribers on a true wire center basis, that is, the accumulated length of the total exchange circuits should theoretically balance in all directions from the central office location. Exchange loop resistance limits must obviously be observed in these calculations although introduction of a limited number of long line adapters can be tolerated where circuit groups are small. This theoretical wire center split must be ignored, however, if a penalty is being introduced in excessive use of heavy gauge cable.

In any decision of this importance a careful analysis of alternatives must be made. To assure accuracy and to avoid oversights a comprehensive layout plan should be originated to make comparisons readily understandable. This is most easily done by a system of districts or areas showing subscribers both on an existing basis and on a projected growth basis. Existing facility maps should be available indicating routing location, size and type of circuit facilities. Then you can make cost comparisons of possible alternative plans which can be converted to annual charge factors.

Having selected the approximate site for the central office location, investigation is then made of

available property. Here the advantage of long range fundamental planning becomes evident. Selection of possible building sites are best considered years ahead of anticipated need and acquired while property values are not inflated by local building booms. However, assuming that property must be acquired belatedly, inflated cost may conceivably influence the relocation to a less desirable site. It is possible that the cost penalty for such a move may be overlooked by failure to recognize the additional cost to haul plant circuits to the site selected as second choice and having the lower initial cost.

An adequate study of this nature should include complete investigation into the feasibility of combining adjacent exchanges where single unit installations are in use and expansion to additional units is not practicable. It is entirely possible that the conversion of two or more closely spaced switching units into a single centralized switching machine may have attractive economic installation and operational advantages. This is especially true where exchange loop resistance limits can be increased by means of changing type of switching machine and where elimination of additional trunk switching results in economy in equipment and elimination of dialing digits.

To summarize, it is noteworthy that in the analysis of the major factors influencing the wise selection of central office locations the commercial survey is of first and paramount importance. To a large extent the long range economy of the selection is dependent on the accuracy of this survey. This is especially true where wire centers are materially affected. It naturally follows that realistic cost comparison of alternative service plans on an annual charge basis is essential.

It is axiomatic but bears repeating that decisions as to investment of capital in plant are of vital importance inasmuch as the plant once constructed must be the source of sufficient earnings to pay off its cost during its lifetime and pay its share of company profits at the same time. This means that it must not only

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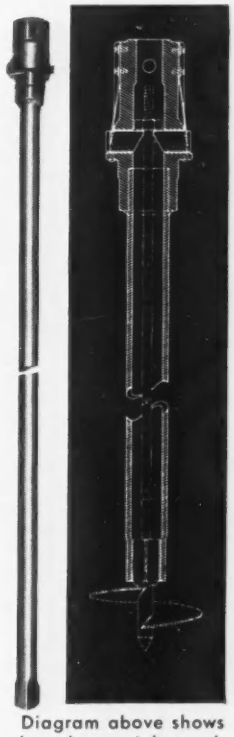

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TEAMING UP on the production line, these employees help turn out modern crossbar dial switching equipment at Western Electric's new manufacturing plant in Columbus, Ohio. Production began here in April, 1960, and in September, 1960, the Columbus Works—with nearly 4,000 employees on the payroll—shipped its 8,000th frame of crossbar equipment.

COLUMBUS, OHIO

Today a little more than a year old, Western Electric's new manufacturing plant in Columbus is already an important producer of dial telephone switching equipment for the Bell System.

Western Electric has discovered Columbus! And its new plant located on a 250-acre tract at the eastern edge of the city attests to the importance of that discovery. For this is a major plant with 1.6 million square feet of space and a total of almost 37 acres under roof.

The people of Columbus bring to us many highly-developed skills and talents to help us make dial telephone switching equipment for the Bell System. And Columbus –a widely recognized educational and cultural center– affords our employees the fullest opportunity to advance in their work and in their aesthetic, social and civic lives.

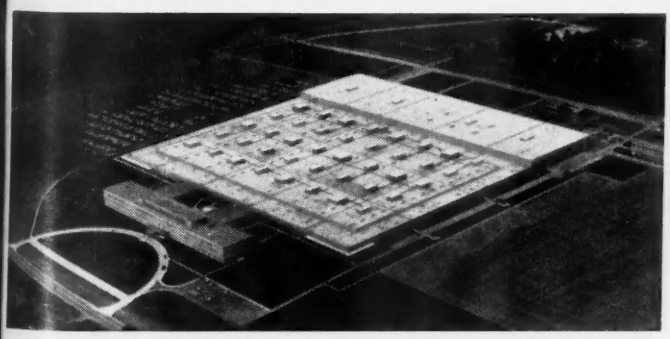
Columbus, too, is benefiting from our discovery – through the many jobs our work here creates, the payrolls spent with local merchants, the taxes we pay, and the many ways we and our employees have become an integral part of the community.

Columbus is enjoying a dynamic period of economic vitality and industrial growth. We at Western Electric are honored to be one of its new neighbors–and we're looking forward to many rewarding years of progress together.

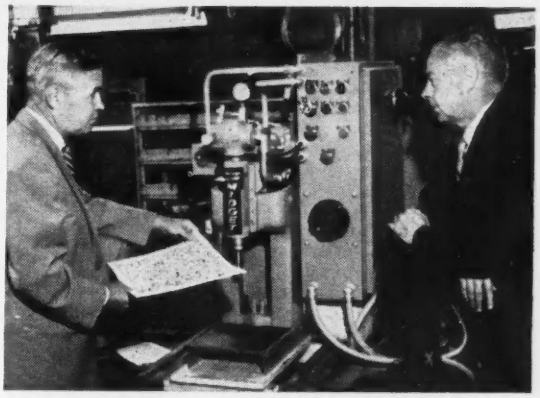
Besides Columbus, Western Electric has 12 other principal manufacturing locations, where we also make hundreds of different telephone products for the Bell System and a variety of other products for the Government, principally for national defense. Last year we purchased over a billion dollars' worth of raw materials, products and services from our more than 35,000 suppliers located in every State of the Union. Of these, 90% are "small businesses." The things we make and buy are distributed to the Bell telephone companies through Western Electric distribution centers in 32 cities.

Western Electric

MANUFACTURING AND SUPPLY UNIT OF THE BELL SYSTEM



NEW WORKS of the Western Electric Company in Columbus, in a nation-wide competition, was named one of the top ten plants built in 1959. The citation reads, in part: "A progressive example of conservative design, Western Electric's huge plant is a marvel of planning for the present and future . . . It meets the challenge of providing a dynamic working environment for a giant workforce."



W.E. RESIDENT PURCHASING AGENT, Donald L. Stone (right), discusses hydraulic Multipress ready for delivery to W.E. with Edwin L. Fouse, Vice President, Denison Engineering Div., American Brake Shoe Co. . . . just one of our more than 2,000 suppliers throughout the State of Ohio.

CHAMBER OF COMMERCE (Columbus Area) president, Paul L. Jones, sums up the community's attitude toward W.E.'s new Columbus plant: "We consider Western Electric one of our most valuable industrial citizens. Its important economic, social, and civic contributions to our area are most welcome."

UNITED APPEAL FUND Executive Director, Robert C. Hicks (right), presents plaque to W.E. United Appeal committee members, Dorothy Neely and Jack Gibbons, in recognition of the third consecutive year that Western's Columbus employees have had over 90% participation in the U.A. drive.

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LONGER LIFE—Superior construction, woven from filament nylon. Stretch has been almost eliminated.

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FLEXIBILITY—Klein-Kord Nylon Safety Straps are extremely flexible and assure maximum comfort and greater strength. When tested in use, these straps are capable of a test load of 2750 pounds, far in excess of any load they will be called upon to support in service.

QUALITY HARDWARE—All buckles and snaps are drop-forged and tested by Klein in their own forge shop.

WRITE FOR BULLETIN 560

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fulfill the objectives for which it is designed but also be able to meet the changing needs of new developments in the future and be flexible enough in design to be added to with future growth.

In a discussion of a subject with the number of facets here involved it is possible only to generalize and lay certain basic ground rules. To the benefit of the industry and under the sponsorship of your Association, the Annual Telephone Engineering Management Conference that has been instituted at Michigan State University covers fundamental planning.

Instructors for this course are very capable men from the telephone industry selected on the basis of their accumulated knowledge and training in this particular field. Having attended the first conference in 1957 it is my considered opinion that time at this conference is well spent. It is also my understanding that with each succeeding year the curriculum has been refined and condensed to meet the specific needs of the industry. In this reference it should be said that in addition to fundamental planning this program includes fundamental economic concepts, cost considerations in engineering decisions and communicating engineering decisions.

It has been well established that in many instances ideas, plans or projects have been well thought out and properly designed but finally failed to be used profitably simply because the engineer or designer had done an inadequate job in selling his idea. This can apply both to oral and written presentation and surely we have all had the experience of reading a report that, while covering the problem adequately, was either improperly arranged or so complex that it was completely incomprehensible to the person reading it for the first time. Here also the engineering seminar can assist your engineer in basic concepts of proper preparation of engineering reports.

In conclusion a general observation on this era of technical development is that perhaps we are all frequently inclined to avoid presenting anything in its simplest form and there is an apparent urge to couch our reports in technical jargon that can only confuse the uninitiated. Even a report such as discussed here on selecting central office locations can become extremely involved and somewhat technical. In this case you are running the risk of losing the effectiveness of your report and authenticity is questioned where complexity obscures the simple conclusions drawn.

This type of situation may have been the reason behind the origination of the definition that has been frequently plagiarized and altered as the occasion demands which defines the telephone engineer as follows: "A frustrated individual who passes as an exacting expert on the basis of being able to produce infinite quantities of incomprehensible design criteria calculated with micrometric precision from vague assumptions which are based on debatable figures taken from inconclusive field surveys carried out by persons of doubtful reliability and questionable mentality for the avowed purpose of confounding a hopelessly overworked and underpaid group of commercial wizards known all to frequently as plant managers." — *Carl Hanenburg.*

"Kineplex" Systems

REPRINTS of the paper, "Recent Developments and Applications of Kineplex," by R. R. Mosier, associate director of engineering, and M. L. Doelz, vice president and general manager of the Collins Radio Co., Western Division, have been published. This 16-page story describes new Kineplex systems designed to provide global digital communications via wire line and radio facilities.

Description of the problems and requirements for digital communications on a global basis is included plus recent Collins' techniques and equipments which are playing major roles in establishing world-wide digital communications networks.

Copies of the reprints are available from *Collins Radio Co., Western Division, Dept. TE&M, 2700 W. Olive Ave., Burbank, Calif.*

"Off The Board"

Communications Securities

Markets As Of Sept. 27, 1960	DIVIDEND	BID	ASKED	LAST SALE
American Tel. & Tel. Co.	3.30			90⅛
Anglo-Canadian Tel. Co. (Br. Col-Dom. Rep.)	1.20	35½	38½	
Bell Telephone Co. of Canada	2.20			47⅜
British Columbia Tel. Co.	2.20	46½	48	
Calif. Interstate Tel. (Calif., Nev.)	.70	13¼	14¼	
Calif. Pac. Util. (Calif., Nev., Ore.)	.90	22½	24½	
California Water & Tel. Co.	1.36	30½	32½	
Carolina Tel. & Tel. Co.	1.60	40	42½	
Central Elec. & Gas Co.	1.20	27	29	
Central Tel. Co. (Minn., Ia., N. C.)	.88	22¼	24	
Chenango & Unadilla Tel. (N. Y.)	1.20	26	—	
Cincinnati & Suburban Tel. Co.	4.50	96½	100	
Citizens Util. (Calif., Pa.) "A"	Stk. only	19¼	20¾	
Citizens Util. (Calif. Pa.) "B"	.48	17¼	19	
Commonwealth Tel. Co. (Pa.)	1.00	21½	23½	
Florida Tel. Corp.	1.00	27½	29½	
General Telephone & Electronics	.76			26½
Hawaiian Tel. Co.	1.00	22	23½	
Independent Tel. Co.	none	8	8¾	
Indiana Telphone Corp.	.50	23	25	
Inter-County Tel. & Tel. Co. (Fla.)	.72+stk	22	23½	
Inter-Mountain Tel. (Va., Tenn.)	.80	15¾	17	
Jamestown Tel. Corp. (N. Y.)	5.60	85	—	
LaCrosse Telephone Corp.	.80	15½	17	
Lincoln Tel. & Tel. Co. (Nebr.)	2.60	64½	—	
Lorain Telephone Co. (Ohio)	1.40	32½	—	
Middle States Telephone Co. (Ill.)	.80	24½	26½	
Mountain States Tel. & Tel. Co. (Ariz., Colo., Mont., Tex.)	.90			25
New England Tel. & Tel. Co.	1.72			36
North Carolina Tel. Co.	none	1	1¼	
Northern Ohio Tel. Co.	2.00	52½	56	
Pacific Tel. & Tel. Co.	1.14			27⅛
Peoples Telephone Corp. (Pa.)	4.00	85	—	
Pioneer Tel. Co. (Minn.)	1.00+stk	35	37	
Rochester Telephone Corp. (N. Y.)	1.00			22⅜
Southeastern Telephone Co. (Fla.)	1.00	22½	24½	
Southern New England Tel. Co.	2.20	44¾	47¼	
Southern Nevada Tel. Co.	1.00	25½	27	
Southwestern States Tel. Co. (La., Ark., Okla., Tex.)	1.20	24½	26	
Telephone Service Co. of Ohio "A"	.36	28	31	
Telephone Service Co. of Ohio "B"	.36	28	31	
Tidewater Telephone Co. (Va.)	1.40	25	28	
Virginia Tel. & Tel. Co.	1.00	20½	23	
United Utilities, Inc.	1.40	44½	47	
West Coast Tel. (Wash., Ore., Calif.)	1.28	27¼	29¼	
Western Union Telegraph Co.	1.40			44½
Western Utilities Corp.	.36	7¾	8½	
Western Lt. & Tel. Co. Inc. (Mo., Kans., Ia.)	2.00	44½	47	

(Source of market — DEAN WITTER & CO.)

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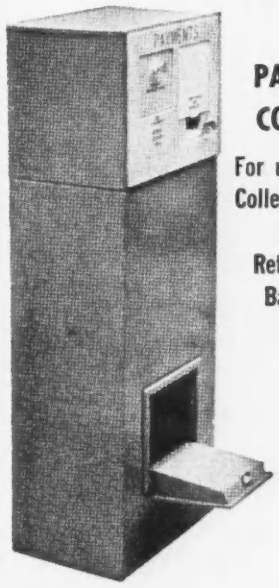

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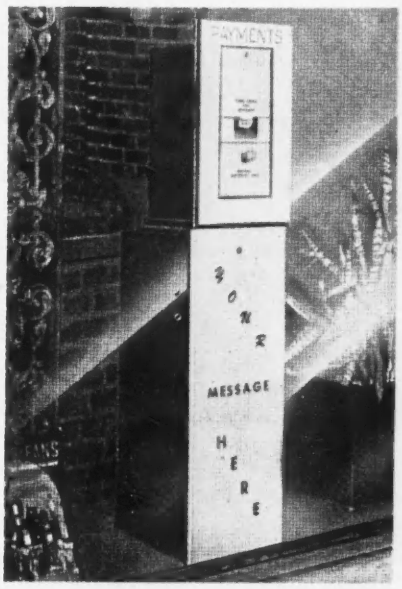

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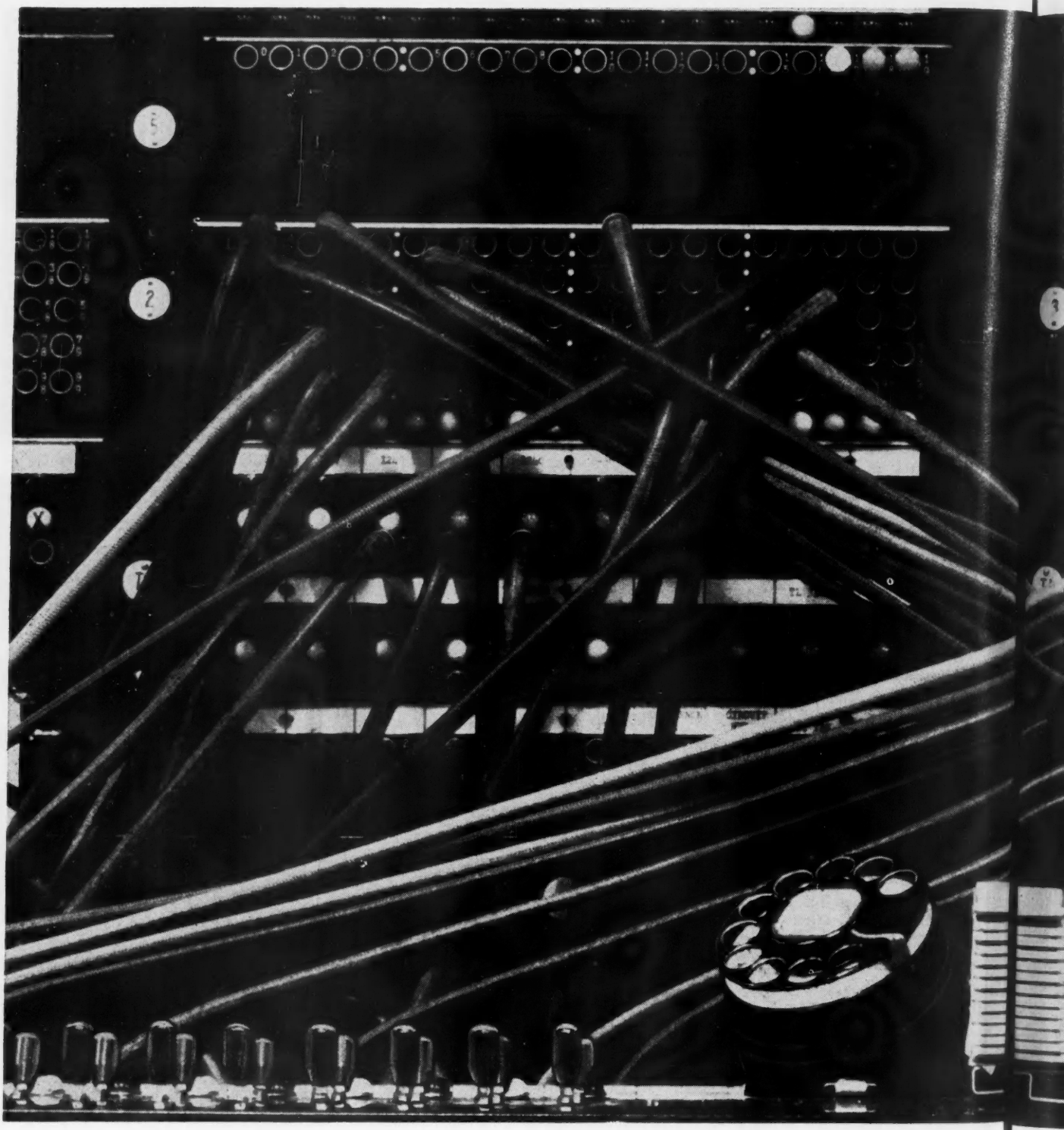

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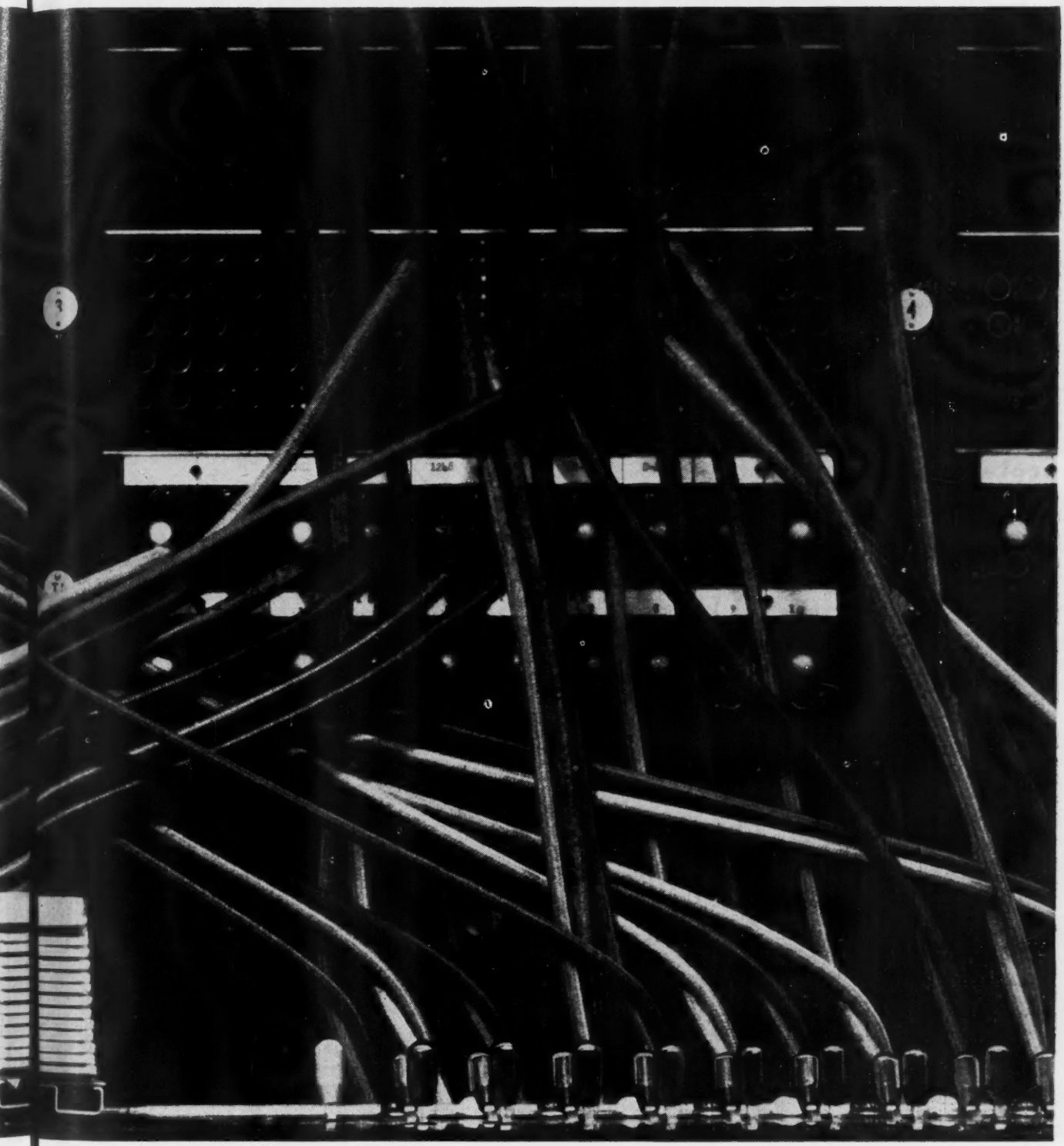

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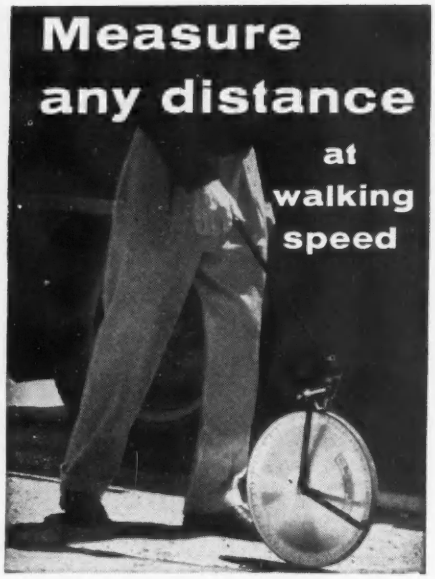

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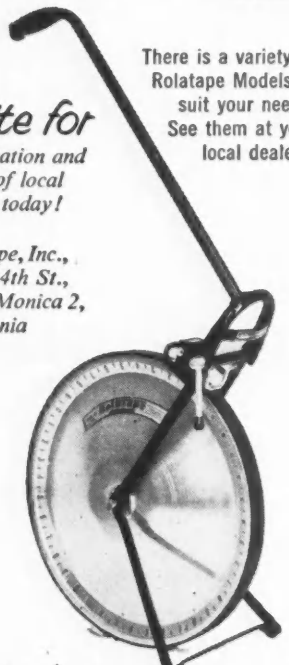

Rolatape
Measuring Wheels

"I wish she'd get a phone and quit beating a path to our door!"

"Put Them On The Line"

(Continued from page 49)

it is the new long span. Subscriber carrier and microwave make up a small but significant part of the plant of REA borrowers.

At the same time, 583 systems had placed in service a total of 2,425 new dial exchanges financed by REA. Most of these were in strictly rural territory which had been without telephones or accustomed to obsolete magneto equipment.

How many people are using these phones? REA loans made to date will bring modern dial service to 1,424,000 subscribers. Close to half of these will get telephones for the first time. Our figures on telephones actually in service are not quite so recent, because they come from periodical reports which borrowers send in to REA, but on December 31, 1959, 1,059,456 telephones were reported in service. These included 122,119 business main stations and 824,291 residence main stations.

It is significant that the program of loans, plant construction, and installation of station equipment has picked up speed as it moved along.

On January 1, 1953, for instance, only $106,500,718 in telephone loans had been approved, and less than half of that — $51,951,000 — had been advanced to borrowers for their use. This is about 15% of the total loans in what was roughly a little under a third of REA's telephone lending history. Some 85% has been made under the present administration.

Similarly, in construction only 21 REA-financed telephone systems had cut over to dial a total of 26 exchanges by January 1, 1953. Outside plant completed by that date was 1,075 miles. The bulk of the construction was accomplished in the last 7½ years, and the pace continues to quicken.

We think part of the explanation for this amazing progress is due to more efficient procedures adopted by REA. We now have two loan programs — electric and telephone — being carried on by the same sized staff that used to handle the electric program alone. We have streamlined lending procedures and reduced the paper work which in the early days complicated construction activities. These changes have enabled borrowers to save time and money and to

get on a sound operating basis just that much sooner.

We are proud of the strong financial position being attained by the great majority of REA-financed telephone organizations. Their improvement in debt service payments is unmistakable evidence that they have been successful in finding ways to bring quality service to rural people on a financially feasible basis.

Since January 1, 1953, REA telephone borrowers have repaid more than $17.5 million in principal; they have paid almost $16 million in interest; and they have built a cushion of credit in advance payments of nearly $3.5 million. The number of borrowers which were behind schedule in payments has dropped steadily until now there are only 13 in this category.

We can see from this that REA borrowers are doing well on a long-run basis despite the relatively high cost per subscriber of providing modern dial telephone service on farms and in scattered rural communities.

"Area-wide Coverage"

AT THE outset, REA's policy of area-wide coverage was scrutinized with a critical eye by many people in the industry. It took a while for understanding that the key word was "practicable." The policy statement is worth repeating, because we hold it every bit as valid today as we did when it was first set forth in the enacting clause of the rural telephone legislation:

"It is hereby declared to be the policy of the Congress that adequate telephone service be made generally available in rural areas through the improvement and expansion of existing telephone facilities and the construction and operation of such additional facilities as are required to assure the availability of adequate telephone service to the widest *practicable* — there I italicize the word 'practicable' — to the widest practicable number of rural users of such service."

In applying the policy, we require borrowers to provide service to the extent that can be fully justified in terms of costs and revenues. Remote and isolated subscribers and very thin

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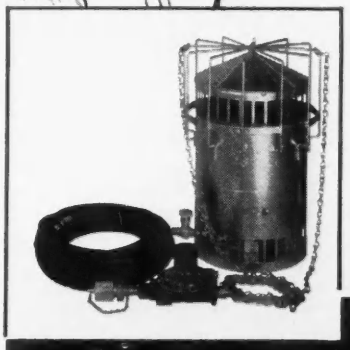

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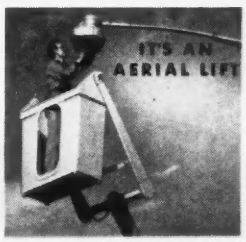

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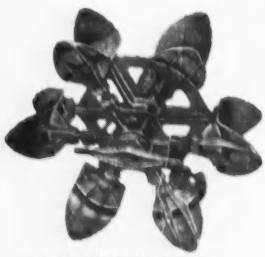

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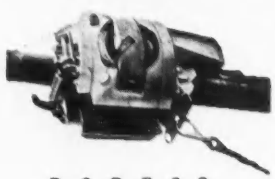

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areas are deleted from subscriber surveys and become subject to the line extension policy to be established as a part of the borrower's tariff after construction of the initial system has been completed.

What we have been saying, in other words, is this: "Build out into the rural areas and put subscribers on the line — to the extent that can be fully justified by a careful study of anticipated costs and revenues."

I think there are sound businessmen within the telephone industry who have been a little surprised to find how much they could afford to expand into rural territory with modern dial service. The long-term financing provided through REA's loans has certainly been one factor in making it possible for you to put rural subscribers on the lines in greatly increasing numbers.

Another has been the rapid technological development in telecommunications. REA has cooperated in many of the improvements in methods, equipment, and materials that have helped hold down construction and operating costs for rural service. Borrower systems have contributed to this progress through field testing of buried plant, long-span construction, subscriber carrier, joint use of poles, and many other possibilities for savings or improved service.

Better toll contracts have been a help to many Independent companies and cooperatives. Consolidations, in some places, have combined small, weak systems into feasible enterprises. Improved management methods have widened margins for still other telephone operations.

Rates and Service

THE attitude of subscribers and potential subscribers toward rates and service can turn out to be a surprisingly strong factor in building a profitable rural telephone business. Some of you already have discovered this and are benefiting by it. There had been some feeling that a great many farm families, accustomed to the 75 cents-a-month magneto switcher line, would not be willing to pay rates of $5, or $7, for dial service.

Well, these apprehensions happily

turned out to be groundless. In some sparsely populated locations, farmers and ranchers may pay as high as $10 a month for multi-party rural service. When you add to this the charges for toll calls and then collect a 10 percent Federal excise tax on the whole bill, it is a pretty big chunk of change. And it is a clear indication of the value that some subscribers place on good telephone service today.

We have seen rates climbing to levels that assure reasonable margins. And the percentage of farms with telephones has been climbing faster than ever before in the industry's experience. Some borrowers have been more fortunate than others. We have records of a very few systems from the early days of the REA program which built for more subscribers than they were able to obtain. More typical, however, is the company or cooperative which passes its 5-year subscriber figure in 3½ or 4 years.

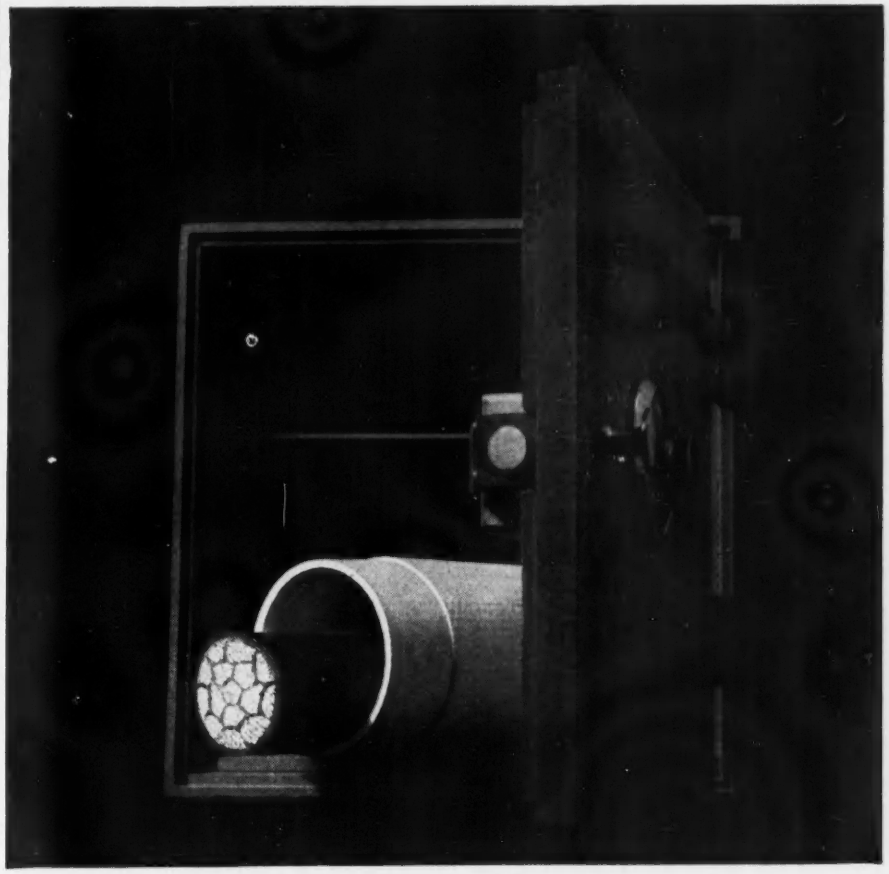
There are several reasons for this phenomenon beyond the happy realization that telephones for farmers are a great thing. Which of them apply to your own operations?

One is the situation in which a town or city spills over in a direction not anticipated, possibly following the path of a new highway. Another is the fortunate circumstance of a new industry or a military installation locating in the area, and bringing in additional population.

This is bonus growth. You can't count on it in advance, but you can be prepared for it. This kind of growth can be absorbed in an orderly manner, and you can put the new subscribers on the line promptly and profitably, if the basic system was built with an eye to some flexibility and with the guidance of long-range planning — and if there is a source for additional financing. REA stands ready to serve you in this.

We urge borrowers and applicants to plan ahead and to provide the kind of space, staff, and equipment which will make a rapid expansion easy if it comes. And REA is on hand to provide your needs for borrowed funds.

Some of our borrowers have surpassed their 5-year subscriber goals ahead of time by sheer hard work



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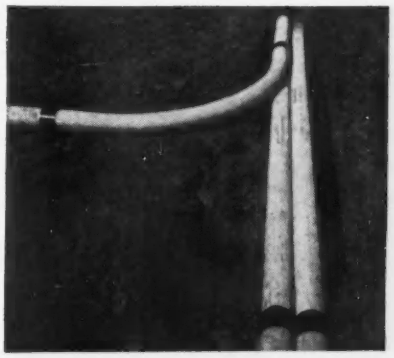

Transite ducts require little, if any, maintenance. The permanently tight joint keeps out water-borne silt and dirt. What's more, it permits pneumatic rodding which can save you 5¢ a foot. No wonder one out of every four feet of telephone duct installed in 1959 was Transite. For further information write Johns-Manville, Box 14 TE-10 New York 16, N. Y. In Canada: Port Credit, Ontario.

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and intelligent management. Dependable service and good subscriber relations are the key ingredients.

Where there is slack line fill, subscribers may have to be signed up the hard way. Certainly, no manager is going to rest on the presumption that if rural people want telephone service they will come to the office and ask for it. But there are managers who become so absorbed in the construction phase of expansion and improvement that they postpone the direct solicitation of new subscribers.

We have found most managers alert to the advantages of full-scale and continuous sign-up efforts. Among the things they do are these:

(1) They train their linemen, installers, and office help to be part of the promotional team that puts new subscribers on the line. Employes who are in constant touch with the public come to represent the company in a very personal way. Employes need to know this and to understand how to convert this relationship into new subscribers, the sale of more services, and company goodwill.

(2) They take time out of their daily schedule to knock on doors and to write personal follow-up letters. The manager of a small system has the advantage of meeting non-subscribers face to face with a friendly, neighborly interest in seeing that they have good service.

Every new subscriber you connect makes your service worth more to that person's neighbors — to every other subscriber on your system, as a matter of fact. Put them on the line!

Subscriber Relations

NOW THAT the construction phase of rural telephony is so well along, I think it high time to turn more of our attention to the commercial activities and subscriber relations which are so important to a well-managed telephone enterprise. There are examples all around us to prove what can be done to increase margins and — what is most important in terms of REA's responsibility under the rural telephone legislation — to get adequate telephone service to more people in rural areas.

I am glad to see borrowers adopting a definition of "adequate" service that means personalized service designed for the needs of the particular subscriber. Along with the need to sign up new people and put them on the line, there is the opportunity to sell the many new services that broaden the subscriber's use of the telephone. These include such revenue-raisers as: extension telephones, extension bells, yard gongs, telephones in color and in new designs to fit particular household or farm needs. Intercom systems with key sets can be pushed on the basis that farming is a business. There is already a widespread rural demand for upgraded service. Perhaps someday we shall have to begin thinking in terms of private line telephones for farm businesses as we do for commercial establishments in town.

In any event, we are past the time when the telephone is regarded as a luxury. And we should be ready now to sell telephone *service*, instead of just putting a conventional black telephone in the center of the house.

Every extension you install provides better service. The average ratio of extension telephones to main stations on the lines of REA borrowers is too low. The percentage of extensions was about 7 percent in 1957, and increased to about 9.2 percent in 1959, but that is still way below what larger companies average in suburban areas. It is precisely the farms that have greatest need for extensions. A level of perhaps 18 to 20 percent is within reach. Every one of you is an experienced enough manager to know what a doubling of extension rentals would do for return on your plant investment.

This is just one example of what you can do. If REA borrowers could exchange views on the subject of subscriber sign-up and service sales know-how, it seems to me a lot of valuable ideas and experiences could be put to wider use. Both the REA and the USITA, as well as the state telephone associations, could give such a program a big boost.

Financial Planning

NOW I want to talk for a moment about something broader in scope

than good sales techniques. This is, after all, but one aspect of management's job. It is important right now, but it is part of a whole concept of management responsibility that is vital to successful operation and continued good service.

Several months ago — in June — REA sent to all telephone borrowers a new policy bulletin entitled, "Financial Planning by Rural Telephone Systems." It sets forth REA's strong recommendation that telephone organizations look ahead to their long-range requirements and plans, as a matter of basic policy.

Financial planning includes a forecast of operations 3 to 5 years ahead, taking into consideration such factors as subscriber development, and capital requirements for system improvements and additions. It includes the development of an annual operating budget, and a determination of funds required for all corporate purposes and the sources of those funds.

We hope you will continue to invest general funds in plant to the extent dictated by prudent management policy and the need for a systematic growth of ownership equity.

We believe that as you grow in financial soundness, you should make advance payments on your REA loans as a cushion of credit. Every business has to keep on hand enough money for working capital, replacement, and emergencies. Dollars not being used for day-to-day expenditures can not be stacked on the closet shelf. For borrowers who want to place funds where they can be recovered on short notice, there are the new REA 2% Treasury Bonds. Already more than $5 million has been invested in these bonds, mostly by the electric co-ops, but some by telephone borrowers.

Long-range planning will help you put your operations on a sound financial base and in a position to furnish maximum service to your present subscribers and to potential subscribers. It is important to go after those potential subscribers. As I look at the rural telephone program today, I think the greatest immediate needs are financial planning and a drive to get additional subscribers. Today is the time to plan for tomorrow's revenues. This is the year to knock on the doors and sell adequate service. — *David R. Hamil.*

Principles of Resistance Design

(Continued from page 68)

on the central office end, where the real economy is to be gained in the larger main cable and branch feeder cables. As cable changes and additions are required for future expansion, the engineer will be working toward this goal. The most economical plant addition will be achieved when the theoretical design is followed in all practical instances.

The chart in *Figure Three* makes available other information required to complete this cable addition. One of the basic fundamentals of Resistance Design requires all loops over 18,000 feet to be loaded. To determine how many loading points will be required, find the line on the horizontal scale representing the ultimate length of the cable. Follow this line up till it passes through the rectangles under the loading data. The example in *Figure One*, using 30 kilofeet, will require four load coil locations. Transmission engineers have discussed many times the pros and cons of loading pure 19-GA cable. At 1000 cycles unloaded 19 GA will meet today's transmission design objectives. At frequencies near 2000 cycles the attenuation is much greater. However, it is now generally agreed that to keep the loss as proportionate as possible over the various frequencies, this gauge (19 GA) cable should be loaded.

Finally the resistance design chart will indicate to the plant extension engineer the locations requiring the improved telephone sets. The transmission design objective is an effective loop loss of —2.0 DB for most telephone companies today. Using —2.0 as the design objective, we can

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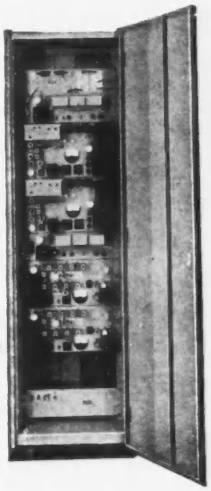

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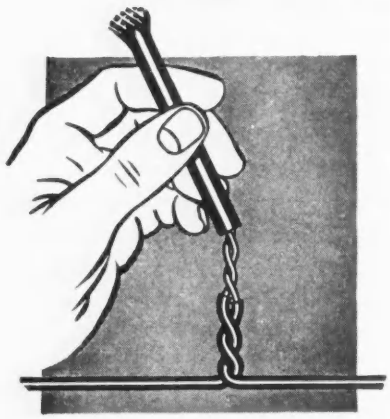

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easily determine the instrument change-out point from *Figure Three.* Locate —2.0 under the heading, Effective Loop Loss Unimproved Set, and follow this line to the point where it intersects the cable under consideration. This point falls between 15 and 16 kilofeet. The installation of a 500-type telephone at this point will give an effective transmission improvement of —3.0 DB.

All of the necessary information has been obtained to proceed with the proposed cable extension. In completing the actual layout, the engineer must take into consideration such other miscellaneous losses as bridged tap loss; drop wire loss, where the length exceeds 500 feet; PBX trunk equipment loss, etc. Excessive line noise in an area must also be given special consideration.

The desirable characteristics, presented by this method of design, will result in improved customer reactions; an economical plant that can be readily expanded with reduced engineering time in planning new cable installations or additions. — *Robert K. Davis.*

"The Independent Telephone Industry"

(Continued from page 45)

and install plant additions and improvements. And of course the years have also successfully tested the mettle, imaginativeness and resourcefulness of telephone manufacturers.

A Big Job Ahead

TODAY there are 70,895,000 telephones in the United States, including Puerto Rico: 60,110,000 in the Bell System, 10,785,000 in the Independent field. This is more than all of the phones in the rest of the world. Nevertheless it is a fact that about one family in five in the United States is still without a telephone.

In this situation lie vast opportunities for additional business. As living standards and incomes increase in the lower economic strata, new demands for communication service will be created. To help develop the potential, telephone companies must make market research tests, continue to emphasize selling techniques, and study ways to reduce costs in order to make telephone service available to more people at the most reasonable cost possible.

In achieving these objectives it would be most unwise to overlook the interests of the investing public. The man or woman who invests money in the telephone business or any other enterprise has a right to recognition. The investor has well been called the one indispensable person in a free economy. If he doesn't receive adequate recognition he will transfer his savings to another economical activity where the grass is greener. This very natural and practical economic fact must be given more sympathetic attention by regulatory authorities as well as by others. In a highly competitive money market no investor is required to let his investment remain in any business. To overlook this very simple fact is to court stagnation and neglect of growing public needs.

To the solution of our seemingly never-ending problems we must continue to look to the best leadership available. We must above all continue to have faith that solutions are bound to come in the future as they have in the past.

We should seek this faith not in fanfare but in the silent precincts of meditation. We should go about our business with a fortitude born of a lustrous past. We should attempt to achieve victory over obstacles with the calm and gentle persistence of disciplined but free people in an atmosphere of economic and political freedom.

A Feeling Of The Statistical Pulse

ONE OF THE important activities of our Association is the compilation and distribution of data relating to the operations of Independent telephone companies. Information

for the current statistical volume covering the year 1959 was obtained from most Class A and B companies, but not all. Reporting C and D companies represented a minority of the total stations of such companies.

The number of reporting companies by classes for the year 1959 compared with 1958 was:

	1959	1958
Class A $250,000 and over	245	230
Class B $100,000 to $250,000	150	124
Class C $50,000 to $100,000	86	98
Class D Under $50,000	52	52
	533	504

Because of the difference in the number of reporting companies from year to year completely accurate comparisons with earlier years are impossible. Yet there are some interesting yardsticks.

Our 1960 statistical volume, reflecting figures for 1959, shows that 245 Class A companies accounted for 8,451,549 stations; 150 Class B companies 349,101; 86 Class C companies 103,697; and 52 Class D companies 24,360, a total of 8,928,707. This represents a station increase over 1958 of 599,362. The company-owned stations of these 533 companies make up about 83 per cent of the 10,785,000 stations served by 3,560 Independent telephone companies at the end of '59.

Total plant investment of the reporting companies on December 31, 1959, amounting to $3,098,369,000 was $366,624,000 greater than the amount recorded at the close of 1958. Reporting companies' total plant investment was 87 per cent of the total Independent industry, which was about $3,580,369,000.

In 1959 the reporting companies had gross operating revenues totaling $801,289,000, an increase of $97,497,000 over 1958. Thus the 533 reporting companies accounted for about 88 per cent of the estimated total revenue of $915,189,000 for 3,560 companies. The revenue of $801,289,000 was derived from the following sources:

		Percent of Total
Local Service	$519,394,000	64.8
Toll Service	$254,147,000	31.7
Miscellaneous	$ 27,748,000	3.5

Annual gross operating revenue per station rose from $87.21 in 1958 to

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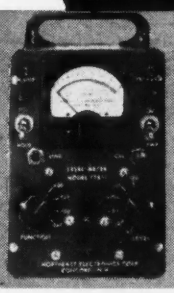

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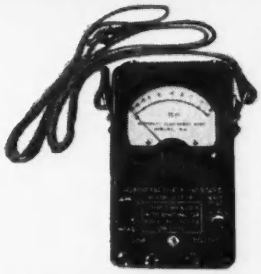

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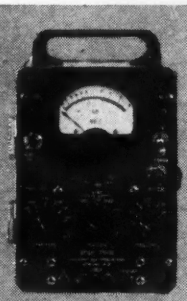

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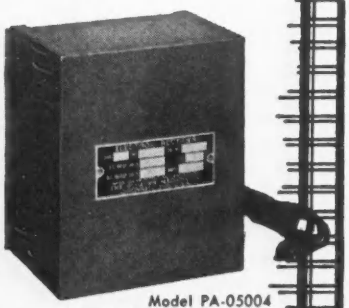

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$92.68 in 1959 while operating expenses including federal income and other taxes rose from $71.78 to $75.70. The average revenue per station of the 245 Class A Independent companies was $93.92. It is interesting to note that the average per station revenue in the Bell System was $131.28 while operating expenses including all taxes amounted to $109.56. The ratio of expenses to gross revenue for all reporting Independents was 82 per cent. This compares with 83 per cent for the Bell System.

Sorry we had to omit TE&M's regular features from this issue. They will be in their usual places in the November issues.

Operating expenses excluding taxes for A, B, C and D Independent reporting companies rose from $142,084,000 in 1958 to $488,822,000 in 1959. The increase in operating revenues exceeded the increase in operating expenses by $50,759,000.

The tax burden amounting to $165,683,000 increased $28,500,000 over 1958. Federal income tax expense accounted for the largest increase in operating cost in 1958. This amounted to $76,461,000 and in 1959 was $94,248,000, an increase of $17,787,000.

The total amount available for fixed charges at the close of 1959 was $152,952,000 compared with $130,163,000 at the close of 1958. Net income available for fixed charges increased in 1959 over 1958 by $22,769,000.

While as heretofore shown plant investment in 1959 increased $366,624,000, net income available for dividends increased $16,806,000. Net income available for dividends rose from $86,409,000 in 1958 to $103,215,000 in 1959. The 1959 amount represented a return of 3.3 per cent upon a total undepreciated plant investment for A, B, C and D reporting companies of $3,098,369,000. For Class A companies above, the ratio of return was 3.4 per cent. In 1958 the return on a plant investment of $2,731,745,000 for all reporting companies was 3.2 per cent.

I wish to repeat the caution expressed earlier. Because of the difference in the number of companies reporting in 1959 versus 1958 a completely accurate comparison between the two years is impossible. — *Clyde S. Bailey.*

"How do you get all those wires in that lead pipe?"

"The Electronics Future"

(Continued from page 47)

age done. But progress *was* made, and out of the war came a new major industry — electronics. After the war, military electronics went on to new high levels as national defense became more and more *electronics* defense, television picked up where it had left off in 1940, and commercial and industrial electronics began to climb very rapidly.

From a total volume of some $500 million before the war and employment of about 70,000, the electronics industry multiplied ten-fold by 1950 and reached $5 billion in the span of only 10 years. This year, electronics sales and revenues should reach $15 billion, with employment of some 2,000,000, of which about 750,000 are in electronics manufacturing, and the remainder in broadcasting and radio communication, distribution and service.

Defense Electronics

EACH of the principal areas of the electronics industry continues to have a strong potential, some of the fields, of course, having larger potentials than the others. Defense electronics has more than doubled in the past five years, and will total about $5 billion this year. You can readily appreciate where a total of this magnitude comes from when you bear in mind such developments as early-warning systems for the detection of intercontinental ballistic missiles, defense systems which protect our supersonic bombers by putting out a signal that would baffle enemy radar; guidance systems for missiles and rockets; navigational and communications systems for aircraft, ground units, ships, and submarines, and a host of other developments.

The ballistic missile early-warning system, which is conveniently called "BMEWS," is a splendid example of the job electronics can do in communications. Those four giant radars up in Greenland are on the alert 24-hours a day and penetrate 3,000 miles toward Russia. If a Russian missile should enter their radar beams, they would flash a warning over a 6,000-mile closed-communications circuit to our retaliatory and defense forces, and these forces would have from 15 to 30 minutes to strike back. Until recently, they would not have had ample advance warning. Our company is playing a very important role in this tremendous project, and we are particularly proud of that fact because it demonstrates so well the many benefits that can be derived from the combined efforts of telephone and electronics people.

Defense electronics today represents some applications which none of us in the industry felt were remotely possible a few years ago, and this again proves how rapidly your old concepts change and entirely new concepts are developed when technology puts some new information and new equipment into your hands. That has been one of the great benefits from electronics — not only have we been able to develop better ways of doing some of the things we already knew how to do, but we came up with some new benefits that we didn't know could be realized. Electronics showed us how to solve some problems that no one knew existed.

Electronic Communications

THIS has been particularly evident in commercial and industrial electronics — which includes, of course, the application of electronics to telephony. Ranging all the way from tiny transistors to complete communications systems, commercial and industrial electronics has gone through the most rapid relative growth of any segment of the industry and today represents a three billion dollar business, representing an increase of 120 per cent in the past six years.

This rapid growth reflects the development of the far broader concept in the telephone business — the concept of communications rather than telephony. This "new look" in the telephone business didn't spring from any single invention or any single

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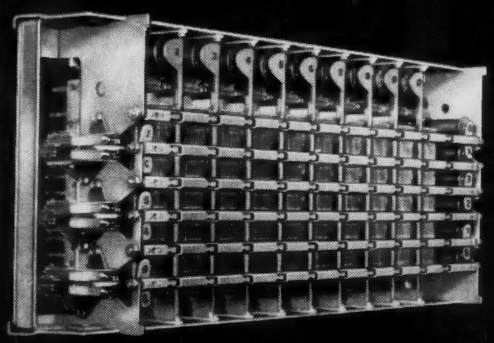

60-T-5

new technique, but has evolved from a multitude of things.

And today we look at communications as *the job of using a steadily broadening range of equipment and techniques to get the right information to the right place at the right time* — whether it is a telephone conversation, or business data, or anything else. In order to do this, in order to get *the right information to the right place at the right time*, we must utilize a more complicated technology and a wider range of techniques than any other major industry.

The impetus behind this large-scale development is, of course, abundantly clear to everyone in the telephone business. As we all know, these techniques arose from the necessity for providing more and more telephone service to more and more people, and yet doing it without causing a major upheaval in our industry.

Some day, and that day is not as far off as you might think, a telephone company will be able to send practically any kind of information to anyone in any place provided he has telephone service — and not only will that mean conversation but it will also mean images, whether they might be a photograph or a drawing, and that wide range of information that comes under that handy little name of "data" — a financial summary, an engineering analysis, an inventory report, or perhaps a detailed and understandable description of how to fix a gas turbine generator set.

And so you can see what I mean when I say that telephone companies have become *communications* companies — and their services are becoming broader and more varied all the time. Our entire sphere of activity has broadened not only to the point that our facilities are being used more and more for other-than-voice communications, but we are thinking in terms of entirely new concepts of communications. Now, then, just what are we trying to do? What new concepts will we have to come up with? We could spend more hours than any of us can spare talking about that, but perhaps I can sum it up by saying that we need *faster* means of communications, and we need more *versatile* means of communications. At the same time, these faster and more versatile techniques must be *convenient* and reasonably *easy to use*, and they must be *dependable*, and *reasonable* in cost. That is quite a large order, but it will be done because that's the way the telephone business operates.

Business Communications

THE FIELD of business communications is a perfect case in point. We hear a great deal about "electronic data processing" these days, and let's explore exactly what we are talking about and the problems we are trying to solve. The problem boils down to this: Businessmen everywhere are literally being snowed under by mountains of paperwork — forms, reports, surveys, statements, all of them containing hundreds of different types of business data.

The big danger is that we could well become so involved in filling out the forms and making reports that we will end up having nothing to report. The challenge facing every businessman is to work out some way of tying together all of the administrative details of running the business, and get out from under the deluge of paperwork. Too many businessmen, in other words, are spending entirely too much time reporting what happened yesterday or the day before yesterday, and not spending anywhere near enough time concentrating on what he is doing *today* and planning what he should do *tomorrow*.

Aside from the sheer volume of paperwork, another challenge makes the problem even more difficult. And that is the challenge of *speed*. The great emphasis today is on speed in developing a new product, speed in getting that new product to market, speed in calling on your customers faster than the other fellow, speed in cutting down on the production of one model and stepping up the production of another, and so on. To keep up with this kind of situation, the businessman must have a wider variety of business information than he has ever had before, and he must have it faster and in more complete form. He must have data on factory production, manufacturing costs, inventories, shipments, distribution costs, and so on . . . and he must have all of that information *in time to do something about it.*

You and I know that the score of last night's ball game may be interesting, but unfortunately we can't do a thing about changing it. It's just so much past history. The situation is the same in business these days, and there we have one of the great opportunities for application of electronics to the telephone business . . . the *communications* business . . . helping the businessman to do a faster and more effective job.

The electronic computer has been described by many people as the brain that makes data processing possible, as the cure-all for everybody's problems. Yet the electronic computer is only a major link in a chain of activities, and no one of these activities runs the entire show. But there is an even more important consideration. The entire data processing system is no better than the data it is processing. There is nothing more useless, for example, than a computer that is being fed inappropriate or inadequate information. Somebody has to get the *right* information from the *right* place to the point where the computers and other equipment can work on it — and that is the job of the communications companies. Tremendous strides have been made in doing this job, but the opportunities for improvement, the opportunities for broader and faster service, are just about limitless.

System Improvements

IN TAKING advantage of these opportunities, there are plenty of problems to solve. One is the development of new system improvements — improvements that will tie in more effectively an electronic data processing machine in one location with another machine in a distant location. In other words, we will have to find ways of making these machines practically "talk" to one another, with the ultimate result that one ma-

chine in San Francisco, for example, will in effect be right alongside a machine in New York or London. Of course, this can be done today, but it can't be done well enough, and we will have to find ways of enabling these machines to talk at the rate of several thousands words a minute. When we attain rates of that magnitude, we will have communications systems that will truly revolutionize business management by giving it far more timely and complete information on which to base decisions.

Now let's get even more specific about solving the problem. A growing trend that has many opportunities for the future is the use of regular telephone lines — in contrast to private-wire facilities — for the transmission of business data. A number of companies, particularly some of the larger ones in the manufacturing field, already have private data processing networks which connect widely dispersed facilities with a data processing center, where a wide variety of information is gathered, computed, and summarized, and then reported back to management.

But I am talking about the use of regular toll facilities. For example, a branch manager would send a variety of information on his day's operations over the toll lines to a data processing center (perhaps one operated by the telephone company), and the next morning he would receive a full report telling him what had happened. But most importantly he would have time to do something about it while the situation is still hot. In fact, it is inevitable that the day will come before very long when toll facilities will be used more for data transmission than for conversation.

There is another major trend which I would like to discuss for a moment, because it injects an entirely new dimension to the telephone system. That trend is "memory" — which, of course, is the ability of exchange equipment to accept and store information for various lengths of time and for various reasons. You can think of any number of direct applications of memory equipment — storing the numbers that are called most often so that the subscriber can put any of them through almost instantaneously, or using a memory device to hold the calling number, the number called, record the length of the call, and calculate the charges. The engineers could cite a hundred other potential applications.

Another field that seems to have an extremely large potential is "slow-scan video," the use of telephone facilities within a given community to transmit and receive images. This is really a type of "business television." Central banks and their branches in various parts of the country already are using this technique to verify signatures, and some companies are using it to transmit maps, technical drawings, and so on. The big advantage is the sender and receiver both have copies and can talk about it. Educational television is, of course, another growing application.

These are only the very earliest beginnings, however, because the use of telephone facilities for image transmission has an unlimited potential. This potential will be realized because of such relatively new electronic principles as "electroluminescence," which we believe will find increasing application in image transmission because of its great flexibility and relative simplicity of operation. "Electroluminescence" involves the use of a flat panel with a series of conductive and luminescent layers

THE TAX REDUCTION OUTLOOK

By CLYDE S. BAILEY

Executive Vice President, U. S. Independent Tel. Assoc.

CONGRESS works in a mysterious way its wonders to perform. The last two sessions were prolific of legislation. Turned out was a formidable record of enacted bills practically all of which are going to add to the cost of government. Many of the appropriations were made for national defense. But much of the grist can be attributed to the fact that next month at the polls there will be a contest for the control of Congress, with all members of the House and one-third of the Senate up for election.

In an election year the major political parties compete with each other in an almost profligate manner to see which can do more for the people, with everyone seemingly oblivious of the fact that government can't give anything away without first taking it from someone. The federal spendthrift policies have made it necessary to increase the national debt limit to $295 billion. This is $10 billion above the ceiling that existed before.

Nothing in the history of our country during the past quarter of a century has been more striking than the claimed inability of both Democratic and Republican administrations to retrench in governmental expenditures. With tenacity each year leaders of both political parties hold to the theme that tax reduction is not feasible. It is a record that has been played over and over again. Bob Hope says that the federal budget is likely to hit the moon before a rocket does.

In his *Decline and Fall of the Roman Empire* Gibbon described the Empire's killing burden of taxation in this way: "The testimony of history is that its people finally welcomed the inroads of the barbarians as a lesser evil than the continuance of their tax system."

The 52 percent corporate income tax takes more out of each corporation than is left for the owners. The 1,000 bills relating to taxes introduced in the recent Congress were an eloquent expression of the widespread dissatisfaction and discontent of the American people with the present tax system in the United States.

He would be bold indeed who would venture a prediction as to when there might be an amelioration of a tax burden which is becoming more and more crushing with each passing year. Certainly it will not come until there is a Congressional will to curtail governmental expenditures at all levels and for all purposes; and that will not come until the American people make their wishes known in terms at once firm and certain. We may hope that a leader will yet emerge who has the secret key, the drive and the persuasive power necessary to step down the tempo of spending, lighten the tax burden, and in this way preserve the qualities of individual initiative and incentive that have made our nation great. — *Adapted from Mr. Bailey's report to the 1960 USITA Convention.*

which light up when an electric current is applied. Through the application of other techniques, these panels can be made to display images transmitted electronically, and we believe this will lead to flat-wall television and flat-panel display of other images.

Space Communications

FROM the standpoint of operating environment as well as technology, it goes without saying that the field of electronics with literally the biggest potential is space communications. The satellites now circling the earth are the forerunners of a worldwide communications system which, in a few short years, will permit highly reliable person-to-person communications throughout the world. As you know, the transoceanic communications we have available today are limited to very-long wave lengths, short-wave radio, and submarine cables. Our scientists envision a network of satellites circling the earth some 2,000 miles out in space, together with space relay stations 22,000 miles above the earth — and this combined system would provide continued long-range point-to-point communications throughout the world, as well as global television and reliable radio-telephone contact with space ships.

This is not some dream that may be 20 or 30 years away. It could easily be a reality by 1970, but we will undoubtedly see it in operation several years before that.

These various opportunities I have mentioned have been just a few of the major applications of electronics to telephony, and we could go into greater detail and talk about the potentials of such scientific fields as solid state electronics and information theory in bringing greater flexibility, lower costs, and higher efficiencies to telephony. Suffice it to say that there are tremendous possibilities for effective use of electronic techniques in the local telephone plant — electronic concentrators are a prime example — just as electronic apparatus has made possible the vast telephone networks in use today.

For the past few moments we have been looking at the technical side of communications, and we have moved our thoughts over quite a distance — from submarine cables to satellites 50 million miles away. But I would like to spend several minutes on the economics of this entire picture. When you get right down to it, all of the developments we have been talking about are truly meaningful only to the extent that they reflect a financially healthy communications business. We all know that technological progress, and the translation of that progress into new and improved service to the public, takes enormous amounts of money — billions of dollars invested in new facilities and equipment. Now, as far as I know, money still doesn't grow on trees. And so the way a telephone company attracts new capital is by earning a fair and adequate return on the capital already invested in the business. This, in turn, enables the company to pay an adequate return to those who have invested their savings in the company, and it also means earning enough to set up a sound depreciation program to replace existing telephone plant as it wears out or becomes obsolete.

I don't have to tell you that all too many telephone companies these days are being hit from two directions. First, the rate bases they are allowed are too low, and second, the amount they are permitted to earn on that low rate base is also too low. It seems to me that all of us in the

GEORGE E. MORSE DIES

GEORGE E. MORSE, 53, manager of telephone sales and secretary of Reliable Electric Co., died on October 4 in Presbyterian-St. Luke's Hospital in Chicago.

Mr. Morse had 30 years of service in the telephone operating and manufacturing fields and had built up a wide acquaintance in the industry as a result of his extensive travels over the country and attendance at state and national telephone conventions.

Mr. Morse became associated with Reliable Electric in July, 1937, when he joined the organization as sales engineer. He became manager of telephone sales in 1949 and was elected secretary in 1955.

Mr. Morse served as a member of the Telephone Equipment Section of the National Electrical Manufacturers Association and was chairman of the Convention Exhibitors' Committee of the United States Independent Telephone Association.

Prior to joining Reliable Eelctric Company, he was associated with the Northwestern Telephone Co. of Freeport, Ill., where he was born on Feb. 23, 1907. He worked for a predecessor company — Stephenson County Telephone Co. — on a part time basis while he was attending school, going on a full-time basis in June 1925. His experience there covered

GEORGE E. MORSE

outside plant, commercial, central office and management.

In 1930, he was placed in charge of plant and commercial operation of the Northwestern Telephone Co., which was under the same ownership and management as the Stephenson County Telephone Co. In 1931, when the two companies were merged into the present Northwestern Telephone Co., he entered the management division and later became assistant general manager.

Mr. Morse is survived by his widow, Eleanor; a son, Stephen; and a daughter, Ellen.

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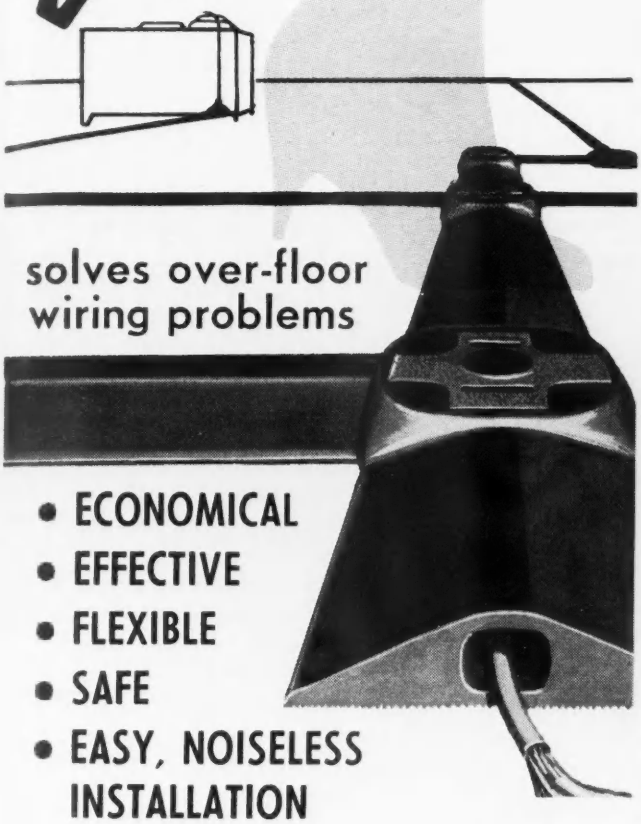

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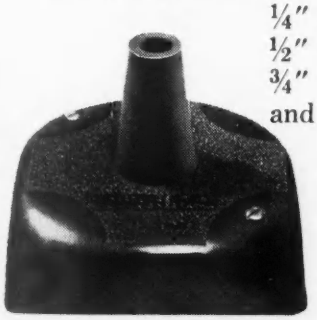

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telephone business must keep hammering home the fact that a telephone company or any other company, regulated or non-regulated, must have adequate earnings if it is to keep on improving and broadening its service. To put it another way: Adequate earnings will, in the long run, enable a company to provide *better service* at a *lower price* than would otherwise be possible.

Assuring adequate understanding of our earnings problem is a day-after-day job. Certainly, this is no easy job. No one likes an increased cost, even if we assure him over and over again that the cost will be less in the long run. But all of us can do a great deal toward minimizing misunderstandings, which really boil down to lack of communication.

All of us are in the communications business, but that means far more than providing a good communications service. It means doing an equally good job of communicating our objectives, our problems, and our needs to the public, and to the representatives and servants of the public — the federal, state and local governments.

Just how well are we telephone people communicating with the public — what kind of an impression do we make in the minds of the people who, in the final analysis, are in the driver's seat? How many times do we find ourselves on the defensive, communicating only because we have been forced into it, only to find that the public is vitally interested in our story and welcomes what we say? How many times have we found that our so-called opposition isn't opposition at all, but simply are people just like us who don't know our story because we haven't told it to them — and by "story" I don't mean slanted, self-serving information, but *facts*, objective facts that speak for themselves.

In closing, I want to re-emphasize the enormous future opportunities in the communications business. Our population is growing steadily — our industries are expanding — and the distribution and service businesses in our local communities are mushrooming. This confronts us with a two-sided problem — the need for providing more and more telephone service, and the need for providing new types of communications services.

I don't know of any industry that faces bigger challenges than ours — but I also don't know of an industry better able to meet those challenges.

USITA Convention Report

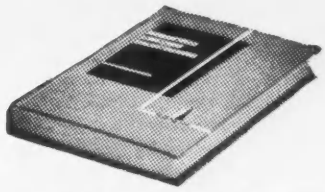
(Continued from page 39)

stated, "Under public regulation as it has existed, insufficient amounts have been earned to enable capital additions or improvements to be made out of earnings."

"Telephone companies," the report stated, "in common with other regulated business, are obliged to look to investors for funds for improvement and expansion. In a highly competitive money market telephone companies because of low rates of return allowed by regulatory commissions have been at a disadvantage in relation to non-regulated business. We believe that more realistic consideration must be given by regulatory commissions to the rate of return element if telephone companies are to be able to plan ahead and acquit their full service obligations to the public."

According to Mr. Bailey, emphasis was given to this problem of inflation and higher prices at the October, 1959 convention of the NARUC in Philadelphia when the NARUC Committee on Corporate Finance stated:

"This Committee suggests that Commissions, as well as utilities, take careful consideration of the economic climate in today's world in setting rates. The postwar period has been one of tremendous growth attendant with a rising price level as a result of the postwar inflation. The prospect for the future is for continuation of the past pattern of growth and inflation. In order to maintain our position in world affairs the United States economy will have to prosper and grow.



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Edited by Douglas C. Greenwood

Editor, Product Engineering Design Digest

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RESISTANCE AND RESISTORS

By Charles L. Wellard

Technical Director, Clifton Precision Products Co.

264 pp., 6 x 8, 82 illus., $8.50

Among the book's many special features you will find a detailed treatment of precision films as a replacement of wirewound resistors. Included, too, is information on the preparation of precision films by pyrolysis, evaporation, and reduction of oxides. Numerous charts and graphs present information that heretofore has seldom been readily available regarding the power and voltage ratings of resistors, the varieties of material used in their construction, and their many industrial applications.

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In the growing economy forecast for the coming decade, utilities must be encouraged to play a significant role. A strong and prospering utility industry is essential to a strong and prospering nation."

At the same convention the Association's Committee on Rates used the following language:

"Growing inflation and higher prices for capital will contribute to higher costs of utility service in the future. With an ever-changing condition in the national economy, considerations in the fixing of rates must be prospective as well as retrospective. To enable regulatory commissions to substitute the long-term interest of all for the immediate self-interest of a few, applicant utilities must submit to the reviewing commission a broader picture than the formerly accepted test year and date certain will provide. Regulatory commissions can make only such disposition of matters as the record in the case will substantiate."

New Officers & Directors

INDUSTRY members elected to three-year terms on the USITA board of directors are Harris G. Allen, Milton Junction, Wis.; Donald F. Anderson, Geneseo, Ill.; Frank S. Barnes, Rock Hill, S. C.; Hugh A. Barnhart, Rochester, Ind.; Harold R. Bollinger, Waconia, Minn.; Charles R. Cashel, Worthington, Minn.; Marion A. Clay, Lufkin, Texas; R. J. Fegan, Junction City, Kans.; Wm. C. Henry, Bellevue, Ohio; William A. Kern, Rochester, N. Y.; and W. G. Winters, Houston, Texas.

Paul H. Henson, Kansas City, Mo., was elected to a one-year term on the USITA board to fill the vacancy caused by the death of Ralph F. Lucier.

At the organization meeting, the directors named Clifford C. Pearce, Riceville, Iowa, president. Pearce, who is president of the Farmers' Telephone Co., Riceville, Iowa, succeeded Foster B. McHenry, Jefferson City, Mo.

Other elected officers are: 1st Vice President, Frank G. La Prade, Martinsville, Va.; 2nd Vice President, Harold A. Bollinger, Waconia, Minn.; 3rd Vice President, R. E. Rudolph, Ellensburg, Wash.; Executive Vice President, Clyde S. Bailey, Washington, D. C.; Treasurer, Carl D. Brorein, Tampa, Fla.; Secretary, George C. Richert, Washington, D. C.; and Assistant Secretary, Courtney S. Snyder, Washington, D. C.

New members of the USITA Executive Committee are: Harold A. Bollinger, Waconia, Minn.; Carl D. Brorein, Tampa, Fla.; R. E. Rudolph, Ellensburg, Wash.; William A. Kern, Rochester, N. Y.; William C. Henry, Bellevue, Ohio. They succeed Frank S. Barnes, Rock Hill, S. C.; Hugh A. Barnhart, Rochester, N. Y.; E. H. Danner, San Angelo, Texas; R. J. Fegan, Junction City, Kans.; and F. G. La Prade, Martinsville, Va.

Pioneers Elect New Officers

THE ANNUAL meeting of the Independent Telephone Pioneer Association (ITPA) was held in the Grand Ballroom of the Conrad Hilton Hotel, Chicago, October 11.

President Berney Simner presided at the ITPA business session.

Directors elected to three-year terms on the ITPA board are: Ray Blain, Falls Church, Va.; John N. Johnson, Fort Myers, Fla.; and C. C. Pearce, Riceville, Ia.

Directors serving unexpired terms are: Hugh A. Barnhart, Rochester, Ind.; Douglas S. Guild, Honolulu; Bertha M. Eaby, Ephrata, Pa.; C. E. McCormick, Erie, Pa.; Fred H. MacGougan, Monrovia, Calif.; and Berney Simner, St. Louis, Mo.

Fred H. MacGougan, Monrovia, Calif., was elected ITPA president. Other ITPA officers are: Vice President, Ray Blain, Falls Church, Va.; Vice President, Mrs. Bertha M. Eaby, Ephrata, Pa.; Executive Secretary and Treasurer, Mayme Workman, Springfield, Ill.; Assistant Secretary and Treasurer, Sophia K. Davis, Springfield, Ill.

TE&M's Technical Editor JOHN S. REED and Mrs. REED visit the TE&M exhibit room during the USITA Convention.

Accounting Committee Report Reviews Rule Making Proposals

THE REPORT of the USITA Accounting Committee, presented by Committee Chairman W. H. Todd of the Northern Ohio Telephone Co., Bellevue, at the USITA Accounting Conference on October 10, reviewed the committee's activities on proposals on rule making made by the Federal Communications Commission (FCC), and the Internal Revenue Service.

Referring to the FCC's proposed amendment of schedules pertaining to wages and hours of employes in annual report forms (Form M, Class A and B Telephone Companies; Form O, Wire-telegraph and Ocean-cable Carriers; and Form R, Radio-telegraph Carriers) as scheduled under Docket No. 13459, the Accounting Committee reported it had recommended the various reports provide for the continuance of reporting the number of employes receiving less than the minimum wage under the Fair Labor Standards Act, and for the remaining brackets to be set out in steps of 25 cents each.

Giving consideration to the number of wage brackets now included on the various forms this proposal would necessitate retention of reporting the number of employes receiving less than one dollar per hour with the top bracket covering employes receiving $1.25 per hour and over.

Discussing the REA recommendation that USITA consider the desirability of proposing to the FCC certain changes in its accounting rules that would eliminate the separate system of accounts for Class C telephone companies, and establish only one basic uniform system for all telephone companies subject to FCC jurisdiction, the Accounting Committee reported REA had set forth the following advantages, which in its opinion, would be gained: It would put telephone accounting on a consistent basis; it would simplify accounting system changes occasioned by growth; it would result in more comparable statistical data; and it would enable uniform guide lines and ac-

counting instructions to be prepared.

The Accounting Committee stated it had reviewed the request and conditions existing due to variation of systems in use between Class A & B and Class C telephone companies and was in agreement with the merit on statistical reports, but felt it could not go on record with a recommendation which was certain to create a hardship on a number of smaller Independent operating companies. The committee report pointed out that very few Class C companies are subject to FCC jurisdiction and, therefore, they would not be covered by the proposed change.

Referring to the FCC's Report and First Order adopted on July 7, 1960 in connection with proposed rule making related to amendment of Parts 45, Preservation of Records of Telephone Carriers, and 46, Preservation of Records of Wire-telegraph, Ocean-cable and Radio-telegraph Carriers, of the Commission's Rules and Regulations to reduce the retention periods for payroll, employe service, mortality, and related records, and to combine into one part the present two parts, the Accounting Committee reported it was in full agreement with the proposal and that the Commission had adopted the changes listed in the original notice.

Reviewing the work of USITA's Subcommittee on Mark Sensing, the Accounting Committee Report stated A T & T representatives had advised the Bell System operating companies planned to standardize on the Plan II ticket.

According to the Accounting Committee Report, the proposed ticket format was reviewed with A T & T representatives in April.

"The advantages of Plan II ticket were discussed from an Accounting and Commercial point of view," the report stated, "and it was pointed out that while, initially, Traffic might realize an increase in operator work time, experience has indicated that over a period of time increased efficiency could offset this factor."

Realizing there is a definite need for more specific information and a greater understanding by many of the smaller Independents, who are not mechanized, but receive mark sense tickets for billing, it has been agreed that a cooperative program by the Bell System and the larger Independent companies could materially assist in improving the use of mark sense toll tickets by the smaller operating companies.

"This data," according to the Accounting Committee Report, "should contain exhibits of the various toll tickets, e.g., collect, third number, and credit card, defining the entries on each ticket and identifying the pertinent information required for manual billing."

The Accounting Committee Report emphasized that it had been agreed and understood that the USITA representatives could not commit all the Independent companies to any one type of ticket or procedure, but it was felt that a more complete educational program on mark sensing of toll tickets would eliminate a number of the present problems.

Discussing All Number Calling (ANC), the Accounting Committee reported the formation of a Sub-Committee on All Number Calling with A. A. Wilson of the USITA Engineering Committee as chairman.

"A meeting was held in New York City in June of this year with one of the major topics being All Number Calling," the Accounting Committee Report stated.

"A T & T is definitely committed to the ANC program, but it is exerting no pressure on the operating companies as to their introduction of ANC. Exchanges not yet on 2L5N basis will become ANC but this affects only 10 per cent of their exchanges as approximately 90 per cent are currently on 2L5N.

"In some areas, the operating companies plan to introduce ANC whenever new numbers are assigned even though the existing lines in the same central office unit are on a 2L5N basis. The final cut to 2L5N could be made when the per cent of 7N would warrant the conversion of the balance of the subscribers' numbers. To the best of our knowledge no major city contemplates making a flash cutover from 2L5N to ANC.

"This is contrary to newspaper reports that Los Angeles would be the first major city to convert all numbers to 7N. A number of the Independents have already set up a plan to go to a 7N as quickly as possible. It would appear easier to convert smaller exchanges on a flash program. Complete conversion to ANC by the telephone industry must, by necessity, be spread over several years because of the complex problem of resetting directories from one style to another."

Taking a quick look into the future, the Accounting Committee Report stated that the past record of the Independent segment of the telephone industry speaks for the progressive and broad view of management to accept new developments and be the leaders in engineering equipment to further more efficient telephone service to a public which expects the best and accepts no substitutes.

Commenting on reports that mark sensing of toll tickets "might be only an interim step to the day when all toll calls will be recorded on tape," the Accounting Committee Report emphasized that this will mean faster and more highly developed machines to handle the ever-increasing volume of business offered.

"The further development of data processing equipment which will require less floor space, fewer machine operators and a greater flexible of expansion at lower unit costs is a positive goal," the report stated. "Industry today is competitive and although we are a regulated industry we must face facts and realize we are a part of a highly competitive business world. We enter the 1960's knowing that the demands for improved telephone service will be greater than any previous period in our history."

USITA Engineering Committee Reports On 1960 Activities

PRESENTING the reports of the USITA Engineering Committee and its six subcommittees, Committee Chairman A. A. Wilson, chief engineer of the Illinois Consolidated Telephone Co., Mattoon, Ill., told the Engineering Conference on October 10 that the Bell System anticipates it will have about 500 "Data-Phone" subsets in service by the end

of 1960, and an additional 2000 in service during 1961.

"The chairman of the Engineering Committee," the report stated, "participated with a representative of the Commercial Committee and the Marketing Committee and representatives of the Bell System in New York on February 16, 1960, to discuss the latest developments by the Bell System concerning 'Data-Phone' service. It was brought out at this meeting that the Bell System feels demand for 'Data-Phone' service has now reached a point of rather rapid development and they are of the opinion that it is of utmost importance that telephone companies have the necessary facilities available so 'Data-Phone' service can be handled over the telephone network as part of the telephone services."

Noting that "Data-Phone" service "would obviously affect the Bell System to a much greater extent than the Independent telephone industry," the Engineering Committee report emphasized "it is necessary for the proper committees of the USITA to make a study of this matter to determine the degree of participation required on the part of the Independent industry."

The report stated the Engineering Committee is investigating the matter of arranging for the publication of an index for technical papers issued by manufacturers and suppliers. It is anticipated that much more up-to-date and timely information would then reach the various operating people and the labor of the various committees would be substantially reduced. This matter is now in the early stages and will require some time for full development.

All Number Calling

THE report of the USITA Subcommittee on All Number Calling stated that all number calling was discussed during a meeting in New York on June 14.

The ANC subcommittee reported that the Bell System strongly recommends ANC in connection with new conversions, or with changes from present four and five-digit dial offices to seven-digit offices. However, the operating companies "can make their own decisions in regard to ANC and they should feel under no pressure on this matter."

Referring to the many advantages and reasons for ANC, the subcommittee report stated that the A T & T Company has issued a booklet which covers the subject. The booklet, issued in February, 1960, is available to Independent companies who are interested. It can be obtained through the Bell-Independent relations manager of the various Bell associated companies.

Direct Distance Dialing

THE USITA Subcommittee on Direct Distance Dialing reported that during the joint meeting in New York between the USITA Engineering Committee and representatives of the Bell System on June 15, 1960, the A T & T Company announced plans for the mechanization of TWX service, and stated it was anxious to proceed on this matter as rapidly as possible with a tentative completion date sometime during the fourth quarter of 1962.

"Briefly," the report stated, "this means that the TWX customers will dial their own connections on the same basis as dialing a telephone call. Subsequent to this meeting, the A T & T Company suggested the assignment of a USITA Engineering Subcommittee to work with their representatives on the various problems involved with the TWX mechanization. It was felt that TWX mechanization would come under the activities of the Subcommittee on Direct Distance Dialing with perhaps the assignment of additional technical personnel from time to time to assist this subcommittee on a consulting basis."

A joint meeting between the DDD subcommittee and the TWX Mechanization Coordinating Committee of the A T & T Company to discuss this matter was held in September. The preliminary phases of the matter were covered, over-all plans of the A T & T Company were outlined, and arrangements were made for future coordination as plans are developed.

EDITOR'S NOTE

To bring you many of the papers presented at the recent convention of the U. S. Independent Telephone Association we were forced to omit the regular TE&M features from this issue. You'll find the features in their usual spots in future issues of TE&M.

Engineering Education

THE report of the USITA Subcommittee on Engineering Education stated that the fourth annual Telephone Engineering Conference, held July 3 through July 22 at Michigan State University, East Lansing, Michigan, was very successful. A total of 64 men attended the program, the largest class to date. During the past four years, a total of 191 men have participated.

The 1960 program was patterned very closely after the 1959 Conference. All members of the faculty were new with the exception of Dr. Gruehr of the Polytech Institute of Brooklyn. Dr. Gruehr did an excellent job of handling Cost Considerations and Engineering Decisions. He coordinated his instructions with that of J. E. Coffman, exchange planning engineer of General Telephone Service Corp., New York City, who taught Engineering Fundamental Plans.

Fundamental Economic Concepts was taught by Dr. James B. Henry, assistant professor of economics at Michigan State University. The subject of Communicating Engineering Decisions was handled by Dr. Hideya Kumata, associate professor at Michigan State. The graduation address was given by Paul Henson, executive vice president of United Utilities, Inc.

Comments offered by the students and faculty indicated that this was the most successful Telephone Engineering Conference experienced to date.

New Techniques & Devices

THE USITA Subcommittee on New Techniques and Devices stated that the subcommittee has continued its study of new developments and

will keep the Independent industry fully informed. In connection with its study of electronic switching, the committee has been in touch with the various manufacturers of this equipment, and while they are active, there is no evidence of much progress in this field during the past year.

According to the report, the director of the subcommittee has been promoting in-dialing to large PBX systems.

The committee has also inspected new dial installations which permit dialing of person and collect calls on DDD. As the investigation of these matters are completed, detailed reports will be prepared for distribution to member companies.

Sorry we had to omit TE&M's regular features from this issue. They will be in their usual places in the November issues.

Radio and Carrier

ONE of the duties of the USITA Subcommittee on Radio and Carrier is the study of FCC proposals, pertinent to telephone companies, with recommendations for Association action when need is indicated, as well as participation in such action as may prove desirable. This phase of its activity has been relatively light this past year.

"However," according to the subcommittee report, "the subcommittee has been deep into continuation of the Dial Mobile (narrow-band) study initiated and reported last year. This study, with the Bell System actively represented, has developed a 'Tentative Proposal' which presents system requirements and characteristics in some detail, especially those necessary of agreement for universal use to provide compatability between Dial Mobile systems throughout the telephone industry."

This "proposal" represents the telephone industry viewpoints, including commercial, traffic and engineering; however, the important factors of cost, reliability, and manufacturing and maintenance facility are matters on which the potential Dial Mobile equipment suppliers can best advise. Accordingly, the subcommittee has submitted its "Tentative Proposal" to numerous manufacturers with the request that they comment and advise on such of the proposals as they may feel desirable to accomplish the objectives of good balance in economy and performance, while retaining the basic operating characteristics necessary for ready incorporation into public dial telephone systems.

The subcommittee reported its plans to complete a "Guide for Compatible Public Dial Mobile Systems (Narrow Band)." It is planned to prepare this "Guide" to assist in purchasing, as well as to offer an educational reference for the telephone company management which is unfamiliar with radio, and also as a reference for suppliers who want to satisfy telephone company (Bell as well as Independent) needs for Dial Mobile Systems.

Transmission & Protection

DURING the year the USITA Subcommittee on Transmission and Protection continued its efforts to encourage the formation of Transmission and Communication Improvement Committees or the assignment of the responsibilities for securing improved transmission to existing committees in the state associations. At the present time 15 states have cooperated in this effort.

The subcommittee report stated efforts are continuing with the pilot South Carolina TCI Committee to develop methods of securing improved transmission and of measuring the progress being made. These methods will be passed on to the state committees. A number of the TCI committees are now holding regular meetings and are furnishing helpful information to the companies within their states. The most effort at present is being directed toward obtaining satisfactory local loops and proper use of high gain sets. Liaison has been maintained with Bell System representatives in New York in order to coordinate suggestions to the state committees by both branches of the industry.

A meeting of the subcommittee with Bell System representatives was held July 25 in New York for the purpose of reviewing transmission developments. An information memorandum is being prepared covering these discussions and will be available for distribution to member companies early this fall. During the meeting the group agreed to the joint preparation of a manual on transmission which will cover all aspects of transmission standards including trunks, loops, protection, maintenance, and measurements. It is hoped that this manual will be available to the industry before the end of the year.

Plant Committee Reports Interest In Power Machinery

THE report of the USITA Plant Committee, presented at the Plant Conference on October 11 by Committee Chairman M. Stapleton Bodine of the Capital City Telephone Co., Jefferson City, Mo., revealed that considerable attention and interest in new power machinery has been evidenced by members of the committee.

"Such items as powered derricks, winches, diggers, aerial ladders, aerial platforms and baskets have been considered," the report stated. "It has been found that some of these devices have materially reduced the work force required to perform certain construction functions. It is not the purpose of this committee to recommend that you go out and invest in this equipment, but it is our purpose to call it to your attention with the view that certain of your neighbors may be in a position to advise you relative to savings that you might be able to effect. The aerial basket seems to be one item that offers considerable possibilities."

Discussing employe safety, the Plant Committee Report referred to the slogan "No Job Is So Urgent That It Cannot Be Done Safely" and urged industry members to remember that "Only by eternal diligence of the supervisory personnel will any safety program succeed."

"This means you," the report said. "It must start with you and you must see that it is carried all the way down the line to the plant man performing the work."

Calling attention to sales of tele-

phone service by plant employes, the report emphasized that the plant personnel "has the greatest opportunity to sell our services to the public."

"They have been doing that for years," the report stated, "but there is still a great undeveloped frontier in plant sales. Possibly the method of sales approach offers the most opportunity for development. It is a subject worth every effort that you can make in its behalf."

The Plant Committee, in closing its report, reminded the member companies of USITA that the committee will endeavor to help any member company with any construction problem it may have.

"It is up to you to contact us regarding your problems," the report stated. "We earnestly request suggestions for (1) improving the services offered by the committee, (2) improving our programs, and (3) subjects to be discussed at our annual meetings."

Traffic Committee Urges Close Study of DDD Requirements

TRAFFIC personnel of the nation's Independent telephone companies attending the USITA Traffic Conference in Chicago on October 11 were warned that although Direct Distance Dialing (DDD) is an important development there are many aspects which should be studied by each individual company.

The warning, given in the report of the USITA Traffic Committee presented by Traffic Committee Chairman D. A. Perigo, general traffic superintendent, West Coast Telephone Co., Everett, Wash., repeated the committee's 1959 recommendations on Direct Distance Dialing, which stated:

"Direct Distance Dialing is an important development in the art of telephony, but there are many aspects which should be studied by each individual company before jumping into a DDD program. Consideration must be given to the receiving of DDD calls.

"Included in this part are the costs of seven digit numbering, satisfactory intercept service, and the number and quantity of trunks. The originating of DDD traffic requires expensive equipment. The savings in traffic and accounting expenses must offset the maintenance and the expenses associated with investment — principally depreciation and taxes. This Committee urges each company to make detailed studies of the economic feasibility before ordering DDD equipment. There will undoubtedly be a time when DDD will be demanded by the public just as local dial has been. For the next few years, however, this Committee feels that DDD should be established on the basis of economics and for growth."

The 1960 report of the USITA Traffic Committe emphasized that "The Committee, after full discussion, can find no reason to change its recommendation . . ."

Referring to Mechanized Operator Toll Ticketing (Mark Sensing) the Traffic Committee Report strongly recommended that Independent companies should adopt this method of ticketing "*only when its studies indicate the economic feasibility in that particular company.*" The Committee opposed "climbing on the bandwagon" for no other reason than "because some other company does it."

In its report the Traffic Committee completely endorsed the theory of All Number Calling, and recommended the adoption of ANC at the time of dial conversion or when total number changes are required for equipment reasons.

"Where 2-5 numbering is already in use," the report stated, "this Committee believes that a gradual shift to ANC by using it for new connections is the economical way of accomplishing the result. In all cases this Committee recommends that a sound public relations program be set up to give the public the full story before any changes are made."

Referring to the Traffic Committee's investigation of the background and the basic studies made by the Bell System in developing new toll coefficients which became effective for Bell System comparative purposes on October 1, 1960, the report stated that "Independent companies which are not on a Cost Settlement basis may have little or no interest in these coefficients."

"As to those companies which do settle on a Cost basis," the report continued, "the Committee sees no way of pre-determining the effect on settlements. The Committee recommends that each Cost Settlement company prepare a toll supplementary peg count on both bases in order to determine the effect. We believe any effect on the settlement will be small, unless there is some unusual circumstance in connection with geography and type of traffic involved . . ."

"All Numbers Calling"

(Continued from page 52)

Frankly, I personally enjoyed Henry McLemore's column on this subject but at the same time I recognized some problems that could develop as a result of its publication.

I happen to be in the telephone company's traffic department and it is our responsibility to get the calls through to completion — and I should add correct completion.

Telephone operators in local manual exchanges are well aware of the fact that many wrong numbers are reached because the *calling party* gave the operator the wrong number. They also are aware that when the calling party discovers the mistake he says to the called party, "I'm sorry. *She* gave me the wrong number."

Strangely enough people become so accustomed to excusing their own mistakes by blaming someone else that after the office is converted to dial and the customer completes his own call by dialing a wrong number, he still says, "*She* gave me the wrong number."

"Remembering Seven Digits"

NOW BACK to Mr. McLemore's column. He bases his case on the fact that people aren't able to remember seven digits. To this we say that people do not remember *any kind* of numbers. Mr. McLemore's column presents a good argument for people to use the directories which the telephone company publishes and also to use the blue books for recording frequently called numbers.

I think we have demonstrated that

we have some problems in understanding. That is the reason for laying the cards on the table to tell you exactly what is going on — why we use All Number Calling in some places but not in others.

Each telephone number that is used with Direct Distance Dialing in either direction, or both, actually uses a four digit central office number. This number is preceded by a central office code of three characters. For long distance calling from other areas there is also an area code of three digits. That sounds fairly simple except that it involves a total of ten digits, so you ask "What's wrong with the present system? Why change it?"

Frankly, there is nothing wrong with the present system as of right now. The reason for changing it is because it will not take care of future growth.

It was only a short time ago that the 2-letter, 5-digit number was considered to be the last word in telephone numbers for the foreseeable future. In 1947 it was adopted as the plan to be used for Direct Distance Dialing. At that time the United States and Canada were divided into 86 Numbering Plan Areas.

Generally speaking, these areas covered a state or a province although some of the more populous areas required more than one area. The Area Codes contained the middle digit of either "1" or "0" which prevented any confusion with central office codes since there are no letters on the "1" or "0" dial pulls except the infrequently used "Z".

Because of the need for special codes, and arithmetic being what it is, there is the possibility of having 152 Area Codes. In 1947 only 56 per cent of the available codes were in use. From then to January 1, 1960, however, it became necessary to use 31 additional codes, or 77 per cent were in use. The State of California, for example, started out with three Area Codes and now has eight.

What has caused this situation? Growth! To emphasize how much growth, let's consider some figures. The telephone systems of the United States and Canada are growing at the

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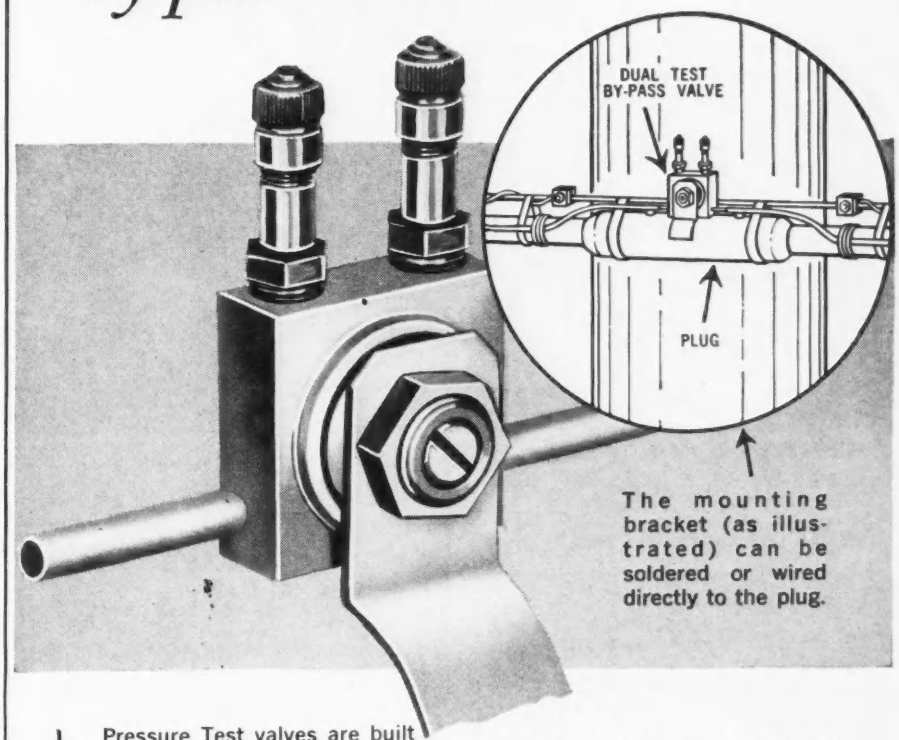

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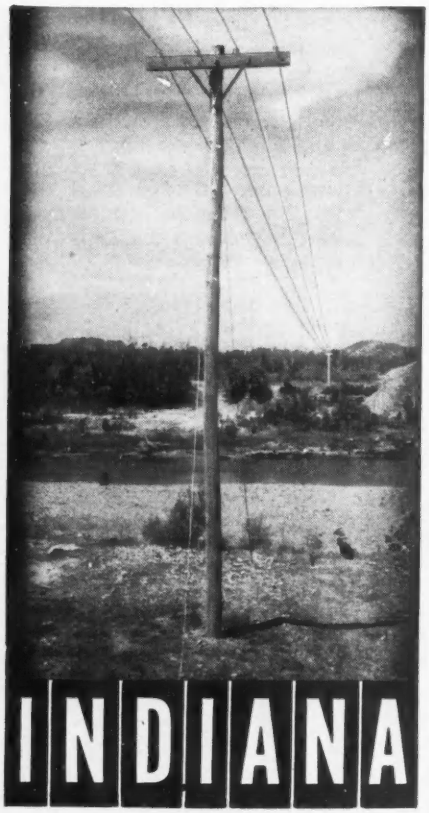

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rate of about 350,000 telephones a month. When we consider 10,000 as a central office unit we find that 35 additional central office codes are required every month.

Any central office code may be used only once in any numbering plan area, otherwise there is a duplication of numbers which, of course, would be an impossible situation.

Central Office Codes

PERHAPS you noticed that I slipped rather glibly from Numbering Plan Area codes to central office codes. This was deliberate to emphasize the reason for using the additional NPA codes. One such reason is because of the limited number of central office codes. When we start running out of Central Office Codes all we can do is start another Numbering Plan Area.

Why are there such restrictive limits to the Central Office Codes? The use of central office names eliminates some of the possibilities, due to the difficulties in connection with phonetics, spelling, etc. The 2-letter 5-digit system allows only 540 central office codes but All Number Calling increases this to 800 or almost a 50% increase in every Numbering Plan Area.

We are looking toward direct indialing to PBX stations, direct dialing to personal signalling sets and to mobile services. These items will use up a lot of central office codes — but will improve our service to the public.

To this point we have been talking almost exclusively about the arithmetic of the call number situation. Let's sum it up briefly. Due to the growth in number of telephones we need more area codes and more central office codes to continue using a basic system of seven characters locally plus three outside the numbering plan area. Unless this is done we would require either eight characters locally or four for Area Codes — or both.

Now suppose we decided to go to eight digits locally. As far as toll is concerned this would mean eliminating such an office from the customer dialing network or that every number throughout the country must be changed to eight digits at the same time, an impossible situation. This is because, at the moment, the equipment would recognize only the first seven digits — so the calling part would get nowhere.

There are other considerations. Let's first look back to our newspaper friend's comments about remembering seven digits. Actually what really happens is that the subscriber will need to remember only the last four digits individually; the first three are remembered as a unit, such as 222 instead of CA2. This has not been a hit or miss decision. Actually tests show there are fewer dialing errors with All Numeral Calling than with the 2-letter 5-digit system.

One of the reasons is because people — both customers and operators — are notoriously poor spellers in this generation. For example, there are people whose spelling causes them to dial MU instead of ME for Mercury — or UK instead of YU for Yukon, VY instead of VI for Viking. We could go on but these examples indicate how a lot of wrong numbers come about. An All Number system would eliminate this problem.

You have noticed, of course, that many customers now use only the first two letters of the central office code on their stationery, statements, billboards, trucks, etc. This is probably to conserve space and reduce costs. At any rate we find that customers are now using only the two letters when passing calls — and not to be outdone, the telephone companies have gone along with the idea. It follows that if only two letters are being used it is not necessary to have names, since any two letters could be used. For example, we might use JK, KK, or WW. As a matter of fact such an arrangement is now in use in a few offices. This is because plans were too far along at the time All Number Calling was officially announced as Bell System policy.

Use of only the two letters, however, leads to some problems in understanding. We can agree there should be no confusion between Temple and Cedar but when those names are reduced to TE and CE it

develops a regular merry-go-round of trying to distinguish which is which when they are spoken. When word is left to call TE4-1212 and the message is taken as CE4-1212 the call is completed to 234-1212 instead of 834-1212. Phonetically speaking the central office names were satisfactory but use of abbreviations developed phonetic difficulties.

International Dialing

POSSIBLY one other point should be made. Some time in the future international dialing will become a reality. Most nations use the same digits — but when it comes to letters it would be next to impossible. Suppose you wanted to dial a Japanese number which used a central office name. You can see what you would be up against in trying to dial it from your telephone using the English alphabet. On the other hand, the Arabic numbering is practically universal. Other countries number their dials the same as we do. This, however, is not true of the letters. In Denmark, for example, the "2" is also ABD instead of our ABC. They put the "C" with the numeral "1" — and this, of course, makes the remainder of the alphabet inconsistent with American dials. In England they have overcome the confusion between "O" and "Zero" by removing the letter "O" from the "6" position and placing it on "Zero."

At the moment I would suspect you have very little interest in whether you can dial direct to England, Denmark, or Japan — but would you deny the future possibilities? The physical possibility of doing this is close, but we doubt if the world will be ready for it by the time the telephone systems are.

As subscribers of ours, we feel you are entitled to know why we are changing in some places but not in others. We are in a long range program. We have an obligation to our customers to operate our business as economically as possible. Resetting directories is a costly item. Changing number plates on all telephones also runs into money. Let's put it this way. There is no question about the future necessity of All Number Calling. It,

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therefore, follows that each company should make the change at the time and in the way that is most economical and in the best interest of the customer.

This means that when an office is converted from manual to dial operation is a good time because all numbers must be changed anyway. Another good time is when we change from terminal per line to terminal per station equipment. In some places it may be good sense to make changes as new telephones are connected. Over a period of years this would take care of a high percentage and minimize the directory re-set charges.

We have one exchange in which there are three central offices. Two are terminal per station with 2-letter 5-digit numbering while the third is terminal per line with 2-letter 5-digit numbering. We are replacing this office and converting to terminal per station. We will use All Number Calling completely in this office. The other two will be changed as new connections are made.

The change-over from 2-letter 5-digit numbering is not required now or in the immediate future. Where we have such a system and there are no equipment reasons for making a lot of changes we expect to continue as is for some time in the future. Such exchanges will probably be done on a gradual basis but no plans have been made as of now.

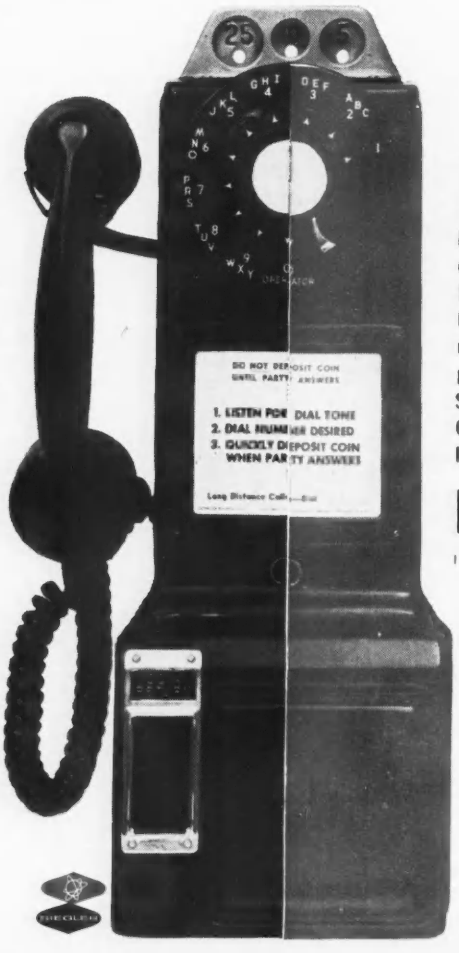
You may be sure of one thing. When you have a seven digit number and the first three represent your central office code you know that your exchange is ready for the future.

There is one word of caution so no one gets the idea a promise is implied in any of these remarks. We are talking about a numbering *system* not individual telephone numbers. There may be times in the future when for the benefit of the service we may find it necessary to change your number even after All Number Calling. This is a normal part of the business, which will continue with us for the indefinite future.

There are many barriers to communication. Language is one, personal belief another — but the barriers are so acute that even accent interferes when speaking the same language. All that is needed to show this is the difficulty an operator from the Northwest and one from the Southeast have in understanding each other. To the northern operator the other operator has such a "southern accent" she can scarcely understand her — and to the southern operator the other operator talks just like a "Yankee."

We know that operator toll dialing, which made it possible for the originating operator to dial direct to the terminating number, eliminated many misunderstandings. Perhaps All Number Calling will someday help on an international basis.

The Commercial Aspects of All Number Calling are (1) the Directory Expense economics of how and when to change, (2) well-instructed employes and (3) an adequately informed public in advance of the changes. — *D. A. Perigo.*



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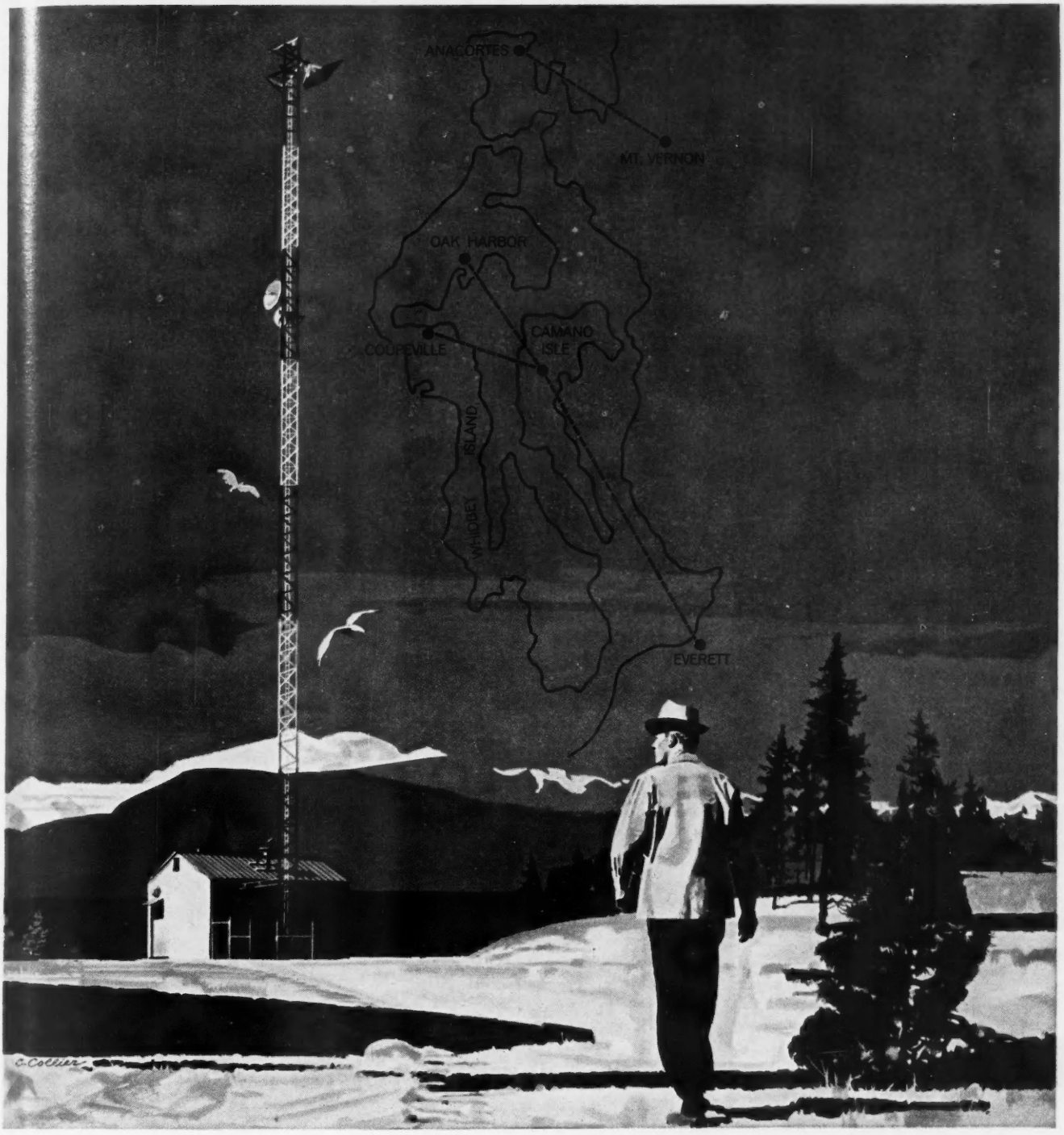

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to link Puget Sound island communities with mainland...

This frequency diversity system provides 56 channels for service to communities on Camano and Whidbey Islands out of a terminal at Everett, Washington. Included are more than 25 miles of overwater spans. Another Collins system installed for this company more than 3 years ago provides service between Anacortes and Mount Vernon. For information on a microwave system custom-tailored to your own needs, contact Collins Radio Company, Texas Division Sales, 1930 Hi-Line Drive, Dallas 7, Texas.

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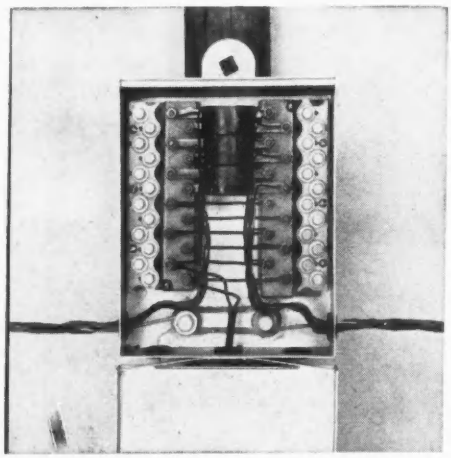

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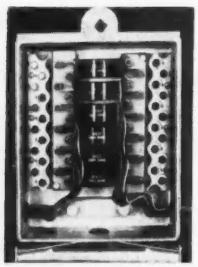
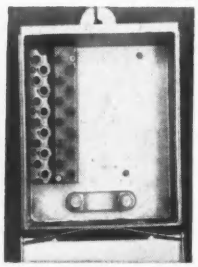
Cast aluminum combination terminal box and housing for loading coils. Designed to be used for rural distribution wire for 6, 11 and 16 pair capacity and available in 8 types to meet your requirements. Terminals are available with or without protectors and designed to accommodate loading coils of 88 MH or 44 MH inductance.

Types 177A-177B



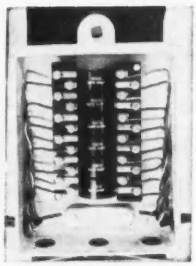
Contains two protected terminal strips complete with type 637A(88MH) or 637 B (44MH) coils.

Type 177F



Contains one protected terminal strip —no coils.

Types 177C-177D

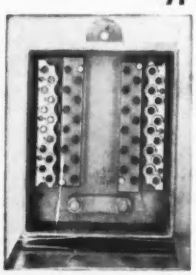


Contains two non protected strips complete with type 637A(88MD) or 637B(44MH) coils.

Type 177G

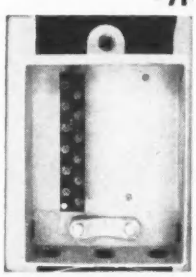
Contains two non protected strips — no coils.

Types 177E



Contains two protected terminal strips—no coils.

Type 177H



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"Networks"

(Continued from page 51)

point still lie in the future. Take for example the communications satellite, recently placed in orbit by Project ECHO, and electronic switching; surely the potentials of these two projects alone will have a momentous impact on our future communications network.

Among the things we must gird ourselves to do as an industry is to provide a completely integrated switching network which will handle all forms of communications. Today, we may still have justification for distinguishing between exchange and toll networks, although I believe we will have to come to think in terms of this one integrated network.

Toll is distinguished by certain switching or transmission standards today, although the time does not appear far removed when this distinction may be justified by tradition only. Due to special circuit band width requirements, it is conceivable that a second or even a third network may be necessary, but, nevertheless, we will soon be faced with the responsibility of handling "machine talk" in much the same fashion that "people talk" is handled today. Who is it that will deny that "machine talk" or data, if you like, may be the major part of our future communications business?

Switching Objections

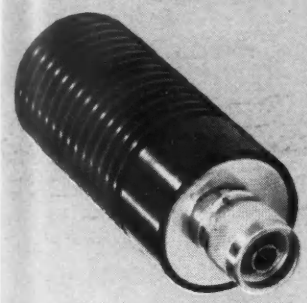
THE ONLY service we provide is through the establishment of point-to-point or multiple connections which provide a media for the passage of information. In other words, we switch networks and provide for transmission of some form of intelligibility. I doubt that the customer cares how we do switch as long as it is convenient to use and is accurate. To be convenient for "machine" usage, network establishment must be automatic to the extent feasible.

I do not think there is any doubt that the customer will continue to demand, and must receive, what to him apepars to be adequacy of transmission intelligibility.

Look at the many different

POWER MEASURING INSTRUMENTS

Sierra offers you now

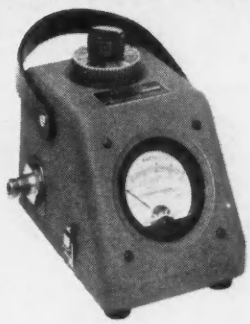


Model 160 50-ohm Coaxial Loads

Now including Models operating to 11 KMC, Sierra 160 Series low VSWR terminations may be used when stable 50 ohm loads are required. Featuring rugged design, high stability at full rated power, the loads have a typical VSWR of 1.2. All models are air-cooled and complete shielding insures personnel safety. Models with power capacities of 1, 5, and 20 watts are available with N, C and BNC connectors. 100 and 500 watt models are provided with Type N connectors. $20.00 to $170.00.

Model 185A Average-Reading Termination Wattmeters

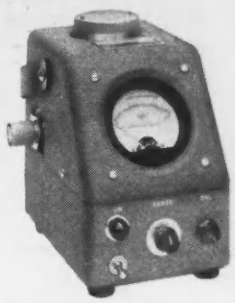
Sierra 185A series are particularly useful in terminating rf coaxial transmission systems, measuring average powers between 20 and 1,000 MC, and as dummy loads for testing and adjusting CW and FM transmitters and oscillators. Three models with maximum power dissipation of 15, 100 and 500 watts, and power ranges of 0 to 5/15, 0 to 30/100 and 0 to 150/500 watts, respectively. Accuracy is ± 5% and VSWR is 1.2. Female Type N connectors. Model 185A-15FN, $170.-00; 185A-100FN, $260.00; 185A-500FN, $315.00.



Model 164A Average Power Monitors

Sierra 164A Series Bi-Directional Power Monitors are now available with plug-ins down to 2 MC. Four plug-ins provide full scale ranges of 1, 5, 10 and 50 watts through frequencies 25 to 1000 MC. Two medium-power units provide full scale ranges 10, 50, 100 and 500 watts, 25 to 1000 MC. Two high-power units provide full scale ranges of 50, 100, 500, 1000 watts, 2 through 75 MC. Model 164 is now available with Type N, C, HN, UHF and LC connectors. Model 164, $115.00; plug-ins, $70.00 to $170.00.

Data and prices subject to change without notice. Prices f. o. b. factory.



Model 194A-A Bi-Directional Peak Power Monitor

Covering the range 200 to 1,215 MC, Sierra 194A-A Peak Power Monitor offers two important, time-saving features—peak power is read directly without computation and a reversible directional coupler permits incident or reflected power readings simply by turning one knob. Peak powers to 30 Kw are covered in 4 ranges. Measurement accuracy is ± 10% full scale at pulse widths down to 0.1 μsec or repetition rates as low as 10 pps. Minimum duty cycle 0.04% for specified accuracy. $460.

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6561

(Continued from page 108)

Today, this adequacy is more or less judged by voice quality; however, with data, other criteria such as bit speed and error rate will become paramount. High quality transmission networks can go a long way in obviating the necessity of "machine" redundancy in error detection and correction features.

I think it is important we bear quality in mind when speaking of an automatic network, especially when considering "machine" originated networks. A company-trained employe, at one time, was in the position of network control in that if wrong points were reached or the transmission intelligibility was impaired, the connection could be re-established with some measure of satisfaction. However, with the customer in control we are not afforded this opportunity.

Switching objectives in automatic networks, as now defined, come closer to being met today than the transmission objectives, primarily because

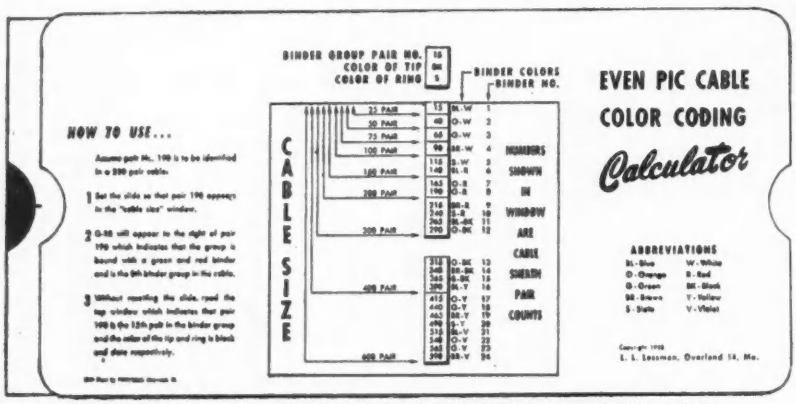
USITA Engineering Conference Speaker B. H. PRYOR, Santa Monica, Calif.

switching tends to be somewhat less complex than the transmission problem in the "continent-wide" communications network. Generally speaking, I would say the same holds true for the small network. Various publications have very admirably spelled out the switching and transmission objectives to be used in operator toll dialing and for Direct Distance Dialing and they need no further coverage at this time. By the same token, network parameters for placing the various forms of data on the message network will be established from time to time as such information can be determined. Regarding objectives, suffice it to say that they are attainable today only by virtue of economies realized by technological advances made in the art of communications in the past.

"Economic Selection"

AS IS TRUE with many things we need or desire, including communications networks, a question in economics arises. Quality in these networks costs money, and with the number of network alternatives available today, very careful studies in economic selection are in order in the planning of a new network or in the use or reuse of an existing network. It is this area of network planning that I would like to dwell on today and set forth some facts and opinions which I feel especially apply to the Independent telephone industry. As contrasted with the Bell System, we are pretty much in the "end link," or at least what you might call the short network end of the communications business. Notwithstanding this situation, these "end links" or short networks are just as vital as is any portion of any network of which they may become a part.

The three fundamental or base media used for communications networks are open wire, cable, and radio. Wire and cable need distinguishment because the planning and use of each can vary considerably. Coaxial cable could be included although its use principally lies in the long-haul networks where generally the Independent telephone companies are not involved. Of course, coaxial cable may be used in connection with the provision of broad-band facilities such as closed-circuit or other television systems. Each of the three aforementioned media has different potentials with significantly different price tags for various applications. Of



THE EVEN PIC CABLE COLOR CODING CALCULATOR

Use this slide-chart Calculator to convert color coding of Polyethylene Insulated Conductor (PIC) cables into cable pair counts, or vice versa. You don't have to have a degree in engineering to operate this device. A housewife, with no knowledge of telephone cable can operate it.

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particular economic importance is the availability of electronic gear and the tendency for technological changes to reduce or at least delay increases in the price of this equipment.

The use of wire or cable can be enhanced by improvements in signaling range, transmission range, or circuit capacity. An early industry example was compositing for a phantom on wire or quadded-cable to obtain an extra circuit for each two pairs available. Low current signaling techniques generally used with composite equipment also had the effect of extending signaling ranges. Applications of voice repeaters made it possible to achieve transmission loss objectives by repeater adjustments rather than by design of circuit length or copper cross section. This same adjustment was also applicable for signaling where voice frequency methods were employed.

Carrier Techniques

THE development of carrier techniques probably contributed more than any other single item in introducing economies leading to the specification of today's network objectives. Carrier equipment has the characteristics of permitting circuit capacity of the base media to be extended many fold and providing transmission and signaling levels adjustable to objective standards. As contrasted with wire or cable, where significant cost reductions due to development are not likely to occur, carrier equipment, being in the electronic family, will no doubt have future improvements so as to materially affect operational economies.

Carrier equipment generally falls into two broad categories known as the long-haul variety and the short-haul variety. The terminal equipment of long-haul carrier tends toward the complex and elaborate having many built-in stabilization features. This sophistication is warranted for stabilization of long circuits and does not materially increase the cost-per-circuit mile. Short-haul carrier on the other hand is designed for less costly terminal equipment, embraces less elaborate circuitry and control and requires the placement of carrier repeaters with relatively short spacings.

Radio equipment, in conjunction with its associated channelizing gear, fits specific applications in the network. Radio equipment may be classified as light density or heavy density systems depending on the quantity of circuits desired in the system.

EDITOR'S NOTE

To bring you many of the papers presented at the recent convention of the U. S. Independent Telephone Association we were forced to omit the regular TE&M features from this issue. You'll find the features in their usual spots in future issues of TE&M.

Radio, being in the same family of equipment as carrier, that is, electronic, can be expected to also be economically improved with future technological advances in the art.

Open wire, cable or radio in conjunction with voice repeaters or carrier equipment may be used on various base facilities and meet today's standards as the situation demands. Any one of the combination of base circuits may be the logical economic solution to a network problem. For instance with open wire, voice repeaters can be used to meet transmission objectives or there are offered a variety of open wire carrier systems which may be used to extend the capacity of the base wire facility. Consideration of terrain, which affects first cost and maintenance, and future route demand should be seriously investigated before the placing of any new open wire. Where existing wire is to be used for carrier purposes, it may be necessary to rehabilitate to attain proper circuit electrical conditions.

Cable is the most extensive medium used for networks today. Availability of electronic gear has greatly advanced the network capability of cable. Negative impedance voice repeaters have been very instrumental in enabling transmission standards to be maintained while significantly permitting reduction of copper volume in the plant. Economic studies will show

generally very definite justification for the placing of fine-gauge plant at today's prices.

Recent developments in short-haul type carrier have also resulted in apparatus which may economically compete with copper in the 5 to 10 mile trunk range and provide circuit quality of the highest order. Negative impedance repeaters and short-haul cable carrier systems may tend to complement one another in plant where the repeaters may be used to permit transmission objectives to be initially met and then such repeaters replaced by the carrier systems in order to extend the capacity of the cable at a later date.

Due to the fact that carrier can extend the capacity of the cable, it has two uses in this respect: the first being to permit the initial installation of a cable with small pair quantity cross section and second to extend the capacity of cable in place and hence defer cable installation by some period of time. These repeaters and carrier systems are flexible in that gain, within the design limits, can be varied as required for transmission purposes and in addition have the further advantage that the equipment may be readily relocated for use elsewhere if and when the need arises.

Radio Equipment

RADIO equipment is making a very forceful entry into today's communication plant. There are a number of cases in which radio presents the most economical answer in network planning. These cases include: (1) Areas of mountainous or difficult terrain where it is necessary to clear obstacles; (2) requirements for broad-band circuits; and (3) temporary situations where it is not feasible to permanently locate other types of facilities.

Important items to consider in the planned use of radio are band width of the system and capacity of the channelizing equipment. The conservation of the frequency spectrum tends to be critical in some geographical areas and frequency diversity systems used in radio should be considered in this light.

Again, bearing in mind that the

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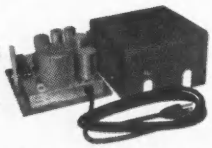

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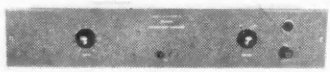

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Rack mounted Compressor Amplifier for Automatic Level Control in Line Monitoring applications.

Two watts . . . 3½" rack space
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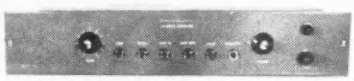

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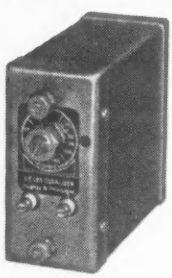

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LE-123 Equalizer is of the shunt type, with a continuously adjustable series resistance having a dial calibrated in ohms.

The LE-123 Equalizer will provide equalization within 1 DB for up to 21.5 miles of 16 ga. non-loaded cable.

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objective of the network is to establish a connection to pass information from one point to another, there are two basic alternatives in making the connection. The first is directly from point to point and the second is to tandem switch through an intermediate point or points. The determination of how it should be done for any particular network is the least expensive way consistent with meeting the objectives of service offered.

The very fact that there is an economic alternative between direct or tandem connections in network usage indicates the necessity for combining switching costs and facility costs into an over-all traffic plan in order to reach valid cost conclusions. Traffic planning in recent years has taken advantage of switching flexibilities and improved transmission techniques to utilize the economies of high usage and alternate routing into the toll traffic plan in particular.

These plans are based on cost ratios of facility and switching costs of the tandem connection versus the direct connection, in conjunction with offered traffic volumes, to determine the economic advisability of using direct (point-to-point) routing for particular segments of traffic. Network utilization for high usage and alternate routing is a subject within itself and I mention it here merely to indicate the importance of integration of all possibilities in network planning.

"Joint Planning"

IN THE Southern California area the networks of the Independents are so closely interwoven with those of the Bell System that a substantial degree of joint or what might be called "industry" planning is necessary, due to the operation of several companies in the same metropolitan area. Phenomenal growth throughout the past 15 years, although at times posing some serious problems, has in reality been a "blessing in disguise" for it has permitted advantages to be taken of the latest technological advances in the art without generally displacing plant to do so.

During this period of time, new transmission and switching objectives have come into being and growth has led to a somewhat orderly transition to the new objectives. Today, some three types of message networks are used in the Los Angeles area and can be described as (a) the exchange and extended area service network, (b) the short-haul toll network and, (c) the toll network.

All of these networks utilize common underlying base facilities to the extent possible and transmission and signaling standards are attained by the utilization of carrier, voice repeaters, interoffice repeaters or other facility additions. The exchange and extended area service and the short-haul toll networks employ the same objective transmission and switching standards, although there are ticketing functions and extensive use of high usage and final trunking in the short-haul toll network. "Via Net Loss" design of the toll network necessitates certain different considerations in this network, although circuits to Class 4 and Class 5 offices still may generally use the same base facilities as the other networks.

In the Southern California networks, the availability of negative impedance repeaters has been a most remarkable tool. This class of repeaters has permitted real economies in that basic designs have been able to use relatively fine-gauge facilities that are within signaling ranges and provide transmission loss control by repeater gains. Every advantage is also taken of the cable capacity expansion characteristics of carrier equipment especially for deferment of cable additions. The use of negative impedance repeaters and cable carriers in this complex network has permitted a great deal of flexibility in the arrangement and rearrangement of traffic trunk groups by virtue of the ease with which this equipment can be shifted from office to office as the planning demands.

Network Planning

WHY is network planning necessary? The basic objectives of all network planning are to: (1) Provide networks which are capable of meeting industry standards; and (2) select alternatives with least cost

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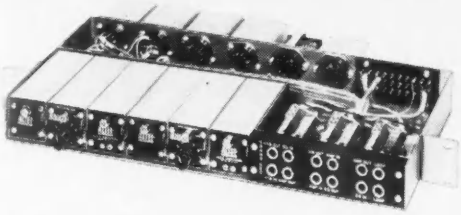

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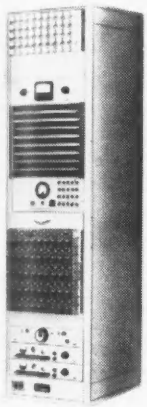

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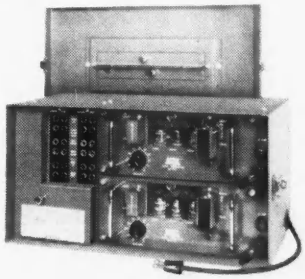

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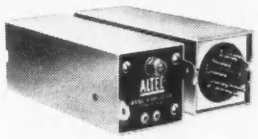

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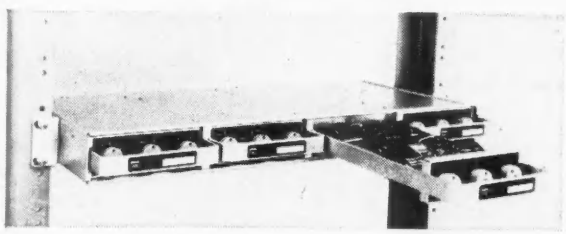

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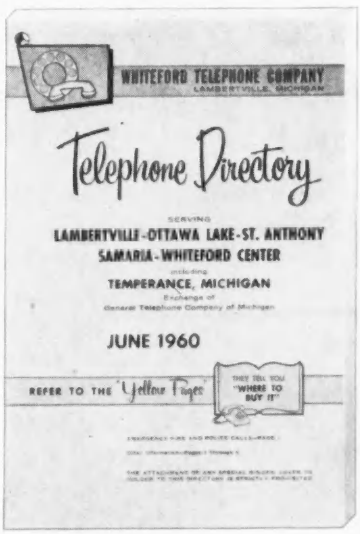

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throughout the study period.

The importance of planning suggests a review of just what goes to make up network costs. There are two rules which might be considered fundamental relating to the economic study more familiarly known as the "economic selection study" and used for a selection of alternatives concerning the extension of telephone plant. These rules are: (1) Convert all costs to a common base; and (2) use a common time period for values involving the use of money.

Although we may commonly speak of investment and expense as separate elements, for the purpose of economic selection studies they are in effect one and the same thing. Investment is nothing more than a deferred expense which will have to be paid out of operating expenses during the life span of the plant placed. This is of course so because of the element of depreciation which makes it necessary to charge a certain portion of the investment each year to operating expense in order to protect the integrity of the investor's capital.

To satisfy the condition of treating all costs on a common base, we generally use the term "annual charge." The "annual charge" should represent the total charges necessary each year in order to support the investment made. The common time period in connection with the use of money is necessary due to interest charges involved. Money to be spent today is not the same as money to be spent at some period in the future. Likewise, expenses for plant additions to be made at different times throughout a study period must be equated to a common time period in order to determine the proper relationship between alternatives which more than likely will incur different expenses at different times throughout the study period.

It is usually common practice to use compound interest tables to convert all charges throughout a study period to what is either called present or future worth. This merely ensures that total dollars expended during a time period will be relative one to another as far as the operation of the business is concerned.

"Cost Elements"

COST elements to be considered in making up an "annual charge" must include all expenses incurred by virtue of the investment made. These expense charges include the following: (1) Cost of capital, including an objective return on equity capital; (2) income tax; (3) depreciation; (4) maintenance; and, (5) other distributed operating expenses.

The cost of capital will be determined by the equity-debt ratio of the capital structure of the company and the objective earnings to be provided to owners for the use of their capital. There is no question about income tax as being an expense to the company. Depreciation is extremely important as this charge is necessary in order to protect the integrity of the owner's investment.

I suggest we be as realistic as possible in the use of depreciation factors in economic selection studies and give due consideration to the factors of obsolescence in the classification of plant being considered. As we are in an age of what you might call rapid technological advances, especially in the fields of electronic apparatus, obsolescence can be extremely important.

For instance, today there are many cases, in fact sometimes you would think it is almost universal, where equipment improvements are being made by the employment of transistors in lieu of vacuum tubes. It is not difficult to see that equipment improvements of this nature will certainly tend to advance the day when existing vacuum tube apparatus will necessitate replacement in order to take advantage of improvements made since the time that the vacuum tube apparatus was placed in service. An evaluation of the depreciation situation will result in the "annual charge" depreciation factor being realistic to this end.

The item of maintenance also may become quite important especially when speaking of the electronic or more sophisticated apparatus. There is sometimes a general tendency to look at maintenance from a historical standpoint based on certain classifications of plant which may or may not

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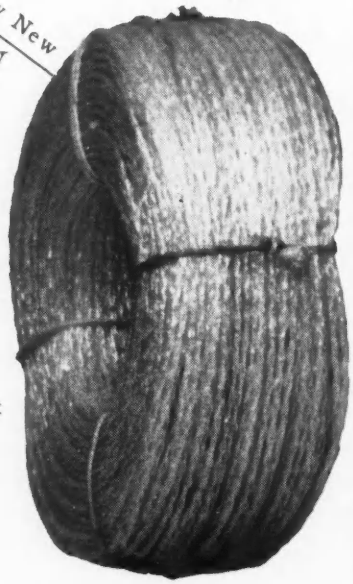

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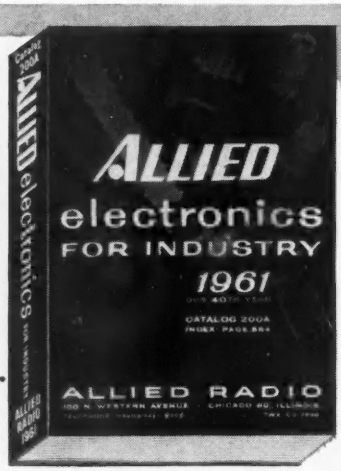

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result in the proper maintenance factors being used as a part of the "annual charges." In this regard, all that is necessary is some flexibility in study development to recognize and reflect the conditions expected as nearly as can be estimated. The other distributed expenses should merely show general overhead or administrative charges attributable to the use of the type of plant being studied.

Conclusion

BY GENERALIZATIONS, I have attempted to touch on several aspects of communications network planning. It is important that networks be "planned" rather than permitted to just "grow." If I have been able to leave you with the impression that: —

(1) We are in the communications rather than in the telephone business;

(2) We must place ourselves in as good a competitive position as possible by giving the customer the quality of service that he demands;

(3) There is a continuing job ahead of us in meeting today's objective standards for switching and transmission and even a greater challenge in preparing for the future, especially in the realm of transmission;

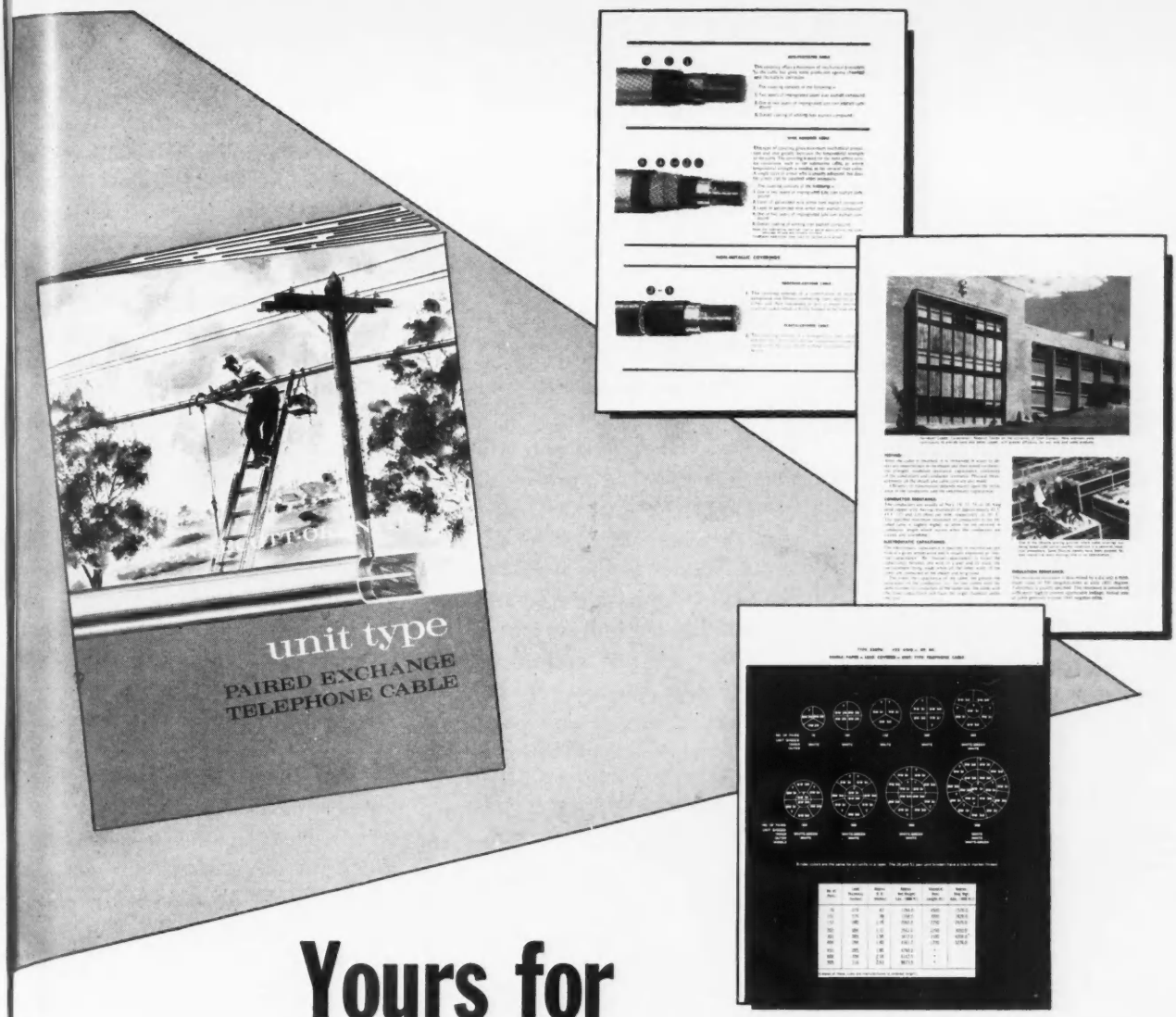
(4) Electronic apparatus made it possible to economically attain our network position today and will be more effective toward this end in the future;

(5) Any network problem should be resolved to the basic and pertinent economic considerations involved; and —

(6) Network planning should include all elements which may have an effect on the economies thereof throughout the planning period, —

Then, you have received the message I had to convey.

In closing I would like to reiterate a point made earlier about our future business possibly consisting predominantly of "machine" rather than "people" talk. As communications companies it is of extreme importance that each of us provides the networks capable of handling data and sees to it that these networks are, in fact, used for that purpose. — *B. H. Pryor.*



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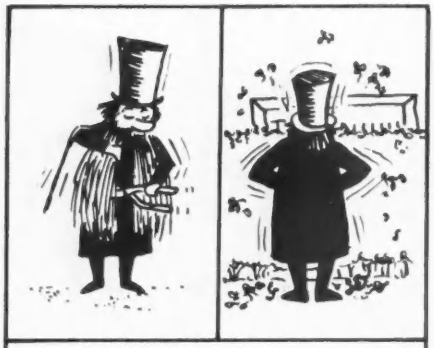

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"Keystone of The Independents"

(Continued from page 43)

blessings, to take stock of ourselves, and to see how far we have come, the question naturally arises: Where do we go from here? What do we do next? What are our prospects? What are our goals?

For three score years and three the United States Independent Telephone Association has been the keystone of the Independent telephone industry. It has been and will continue to be *a force on which affiliated companies can depend.* One of our chief activities to which we have always looked to the national Association for leadership has been that of obtaining for Independent companies their fair and proper share of toll revenue. Negotiations with the Bell System have become more and more a complex and exhausting affair, and it is a job for experts who know their way around in this intricate field fraught with so many obstacles.

At last year's convention it was reported from this platform that our Settlements Committee had reached an agreement with the Bell System for an annual increase in toll compensation of approximately $12 million, based on estimated 1959 overall toll traffic volumes, or about $8 million to $9 million of additional revenue annually to Independent companies settling on average cents-per-message schedules. It was reported also that agreement had been reached on increases in settlements for private line services and foreign exchange services totaling approximately $750,000 annually. The total sum going to Independents in 1958 for settlement on interchanged business was approximately $204 million. In 1959 it was $232 million and it is estimated that total receipts to our industry during this year of 1960 will exceed that sum substantially.

Toll Negotiations Resumed

HOWEVER, with the impact of inflation, of higher taxes, of higher wages and of higher operating expenses generally, it is felt that the share of Independent companies in the total revenue on interchanged business should be larger than the amount we are now receiving, and that the time lag in giving practical recognition to increased costs should be materially reduced.

For this and other reasons your officers and the chairman of your Settlements Committee, acting with the approval of our Executive Committee, approached the Bell System representatives at a conference in New York a fortnight ago at which time we entered into negotiations with the AT&T people looking toward an upward adjustment in national average cents-per-message schedules for "A," "B," and line haul operations. These upward adjustments, we feel, will more accurately reflect increased Independent company costs of providing Bell-Independent interchanged message toll telephone traffic. These negotiations are going on apace and the Association's Washington office will keep you informed as to their progress.

I might add that our Executive Committee has authorized the Settlements Committee to seek the approval of the FCC, by formal proceeding if necessary, for use of the USITA Separations Manual for settlements of Bell-Independent interstate interchanged message toll telephone traffic.

Therefore, it is clear that one of our chief goals for the coming year will be the Association's continuing effort to bring these negotiations to an early and profitable conclusion. In this field particularly we shall exert our utmost energy to establish the fact that the United States Independent Telephone Association is "*a force on which associated things depend.*"

We have many other goals, of course. They include a continuing and unrelenting effort to obtain repeal of the iniquitous excise tax on telephone service, and the preservation of our switchboard operator exemption, as well as other legislative measures affecting the welfare of our

companies. It is obvious to our members, I think, that our national Association is in the thick of the battle every day, looking out for your interests and the interests of all Independent telephone companies in the national theater of activity. During the remainder of this year, during 1961, and during the years to come, the USITA, fulfilling its important role as the keystone of Independent telephony, will continue to concern itself with the serious problems affecting our industry.

In addition to activities on the legislative front we shall continue to represent our companies in matters before the Federal Communications Commission and other governmental agencies in the nation's Capital. We shall continue our struggle for the rights of our companies when it comes to the allocation of microwave and radio frequencies. We shall continue our efforts on behalf of Independent companies which are participating in the SAGE network and in other governmental communications

USITA President FOSTER B. McHENRY presented this paper at USITA's 1960 convention

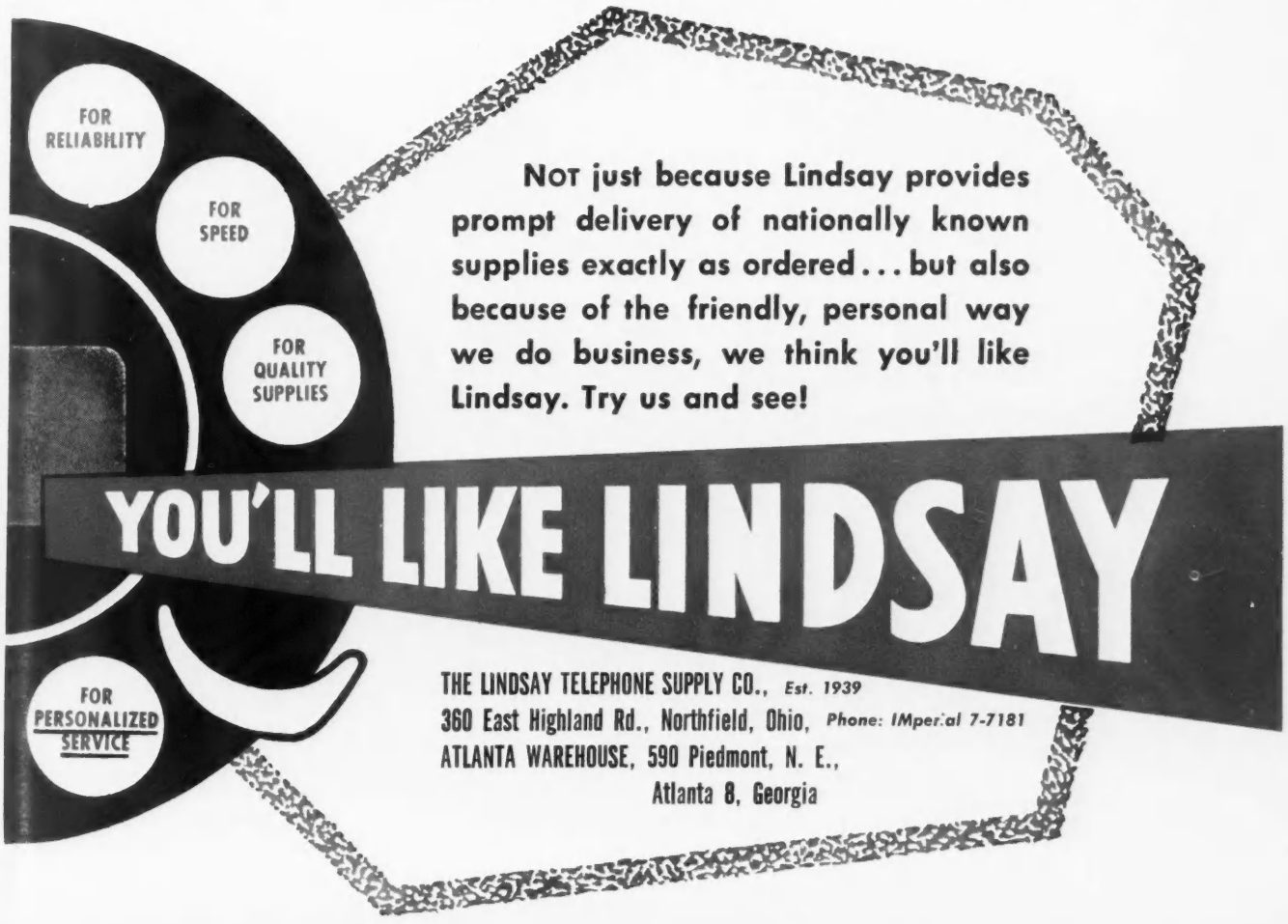
projects. In short, we shall continue to do everything in our power to see to it that the Independent telephone industry is accorded its rightful place in the sun as one of the country's outstanding enterprises and as a substantial facet of the American economy.

Great Changes Present Challenges

A WHILE ago I raised the question: what are our prospects? Our prospects, I think, are excellent, *if* we grasp our opportunities and *if* we face squarely up to the challenges ahead. I believe that the future growth of our business largely will be dependent upon our ability and willingness to say to the public, "Yes, we will treat you as you want to be treated and as you deserve to be treated."

Great changes have taken place in our industry during the past ten years and they are taking place daily. We have been jolted out of our false sense of security which was engendered by the fallacy that we are a monopoly.

We know that the characteristics of our business have changed. We know that we are not a monopoly, and that there are many other places where customers, especially large business customers, can go for communications. Our competitors are snapping at our heels, constantly looking for ways of invading the common carrier field. For these and other reasons we must continue to take steps to strengthen public faith in us as a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service organization, and to place our companies and their employes at the highest possible level in the opinion of our customers and the public.

We know that we are giving better service today than at anytime in our history. But we know that we must go further. The public is more demanding, and is more intolerant of inferior service than ever before. We must not only be good but we must develop in the public the belief that we are the best.

The image that we seek to build and maintain, or strengthen where it now exists, requires a recognition of the competitive world in which we live and a desire to beat that competition by doing a better job than others. It demands that every public contact be based on the premise that we can provide the service the way the customer wants it, and our first objective is to please him.

It insists that our buildings, our plant, our equipment, and our people present to the public at all times an aggressive, forward-looking, hard-hitting organization that is vital to their well-being. It means performing our outside plant work with a minimum of inconvenience to the public. It means searching out opportunities by all of us to demonstrate our good citizenship. It means gaining acceptance by regulatory and political bodies of the theory that adequate earnings in the long run give better service at less cost.

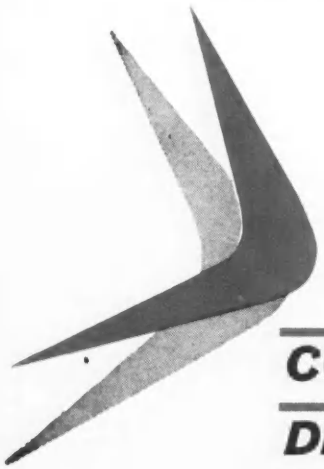
We Must Promote and Sell

IT MEANS also that we must strive for good profits by developing jointly and efficiently the full market potential in the communications field. It means we must continue industry-wide promotion in shaping favorable public opinion. We have accomplished a great deal in this regard since we first instituted our national advertising program six years ago. That program, I am happy to say, will be continued during this coming year.

If our companies are to continue to grow on a profitable basis, vigorous promotional effort locally also will be required. When it comes to advertising and promotion, perhaps we can take a tip or two from the Bell System. Last year the Bell System increased its advertising account to $42,224,000, which was an increase of 16 percent over 1958. About two-thirds of the Bell's advertising budget is for promotional advertising; the balance is to inform the public about Bell telephone policies, and to aid their customers in making the best use of their service.

Speaking of the Bell System, I want to take this occasion to say that I am sure most of us agree with a statement made recently by AT&T President Frederick R. Kappel, who, in emphasizing that telephone companies must grow as a business that can meet competition wherever it may develop, said:

"The continuing essential is that we have real freedom to manage. Good earnings, good profits, for instance, are fundamental to our ability to make the investments in the future that produce progress. Regulation,



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necessary as it may be, must still leave room for adequate incentives and adequate rewards. And the general attitude of government must be such as will encourage effort, rather than discourage it. We deeply want to be — and our country needs us to be — a vital, buoyant, dynamic force for progress. To be this kind of force, this kind of organization, this kind of people, we need reasonable freedom; freedom under regulation, to be sure, but freedom just the same."

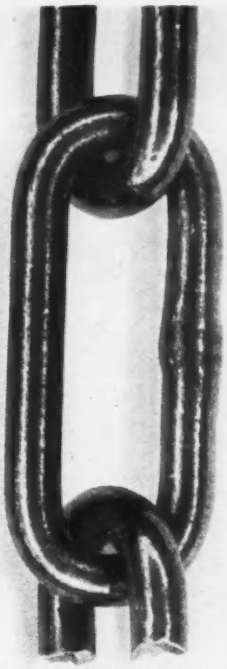
Individual Effort Is Vital

AS WE reflect on the road ahead, we are confronted with more than a need for growth of organized activity as represented by our national Association. The growth of organized activity — and believe me we have grown remarkably, especially these past few years — increases the need for vital, strong-minded people who are trying to develop their unique individual capacities to the utmost. No organized effort can long succeed, or even move in the right direction, except as able individuals make their high personal and distinctive contributions to it.

We have in our audience and in attendance at our technical conferences a healthy representation of young people, some of whom are coming up in management, including those who are graduates, so to speak, of our Management Development and Engineering Seminars.

At the risk of seeming a little pedantic, may I say to all of you — and especially to you younger men and women — there is only one person who can develop your capabilities, and that is you yourself. This is your responsibility and it cannot be anyone else's no matter how much training you receive, no matter how much other people help you, no matter what things are put in your way to stimulate your mind and nourish your growth — none of this can ever take over your development as a person.

As we approach one of the most important elections ever held in this country, may I suggest that you take your political responsibilities seriously. In a democracy, the only good



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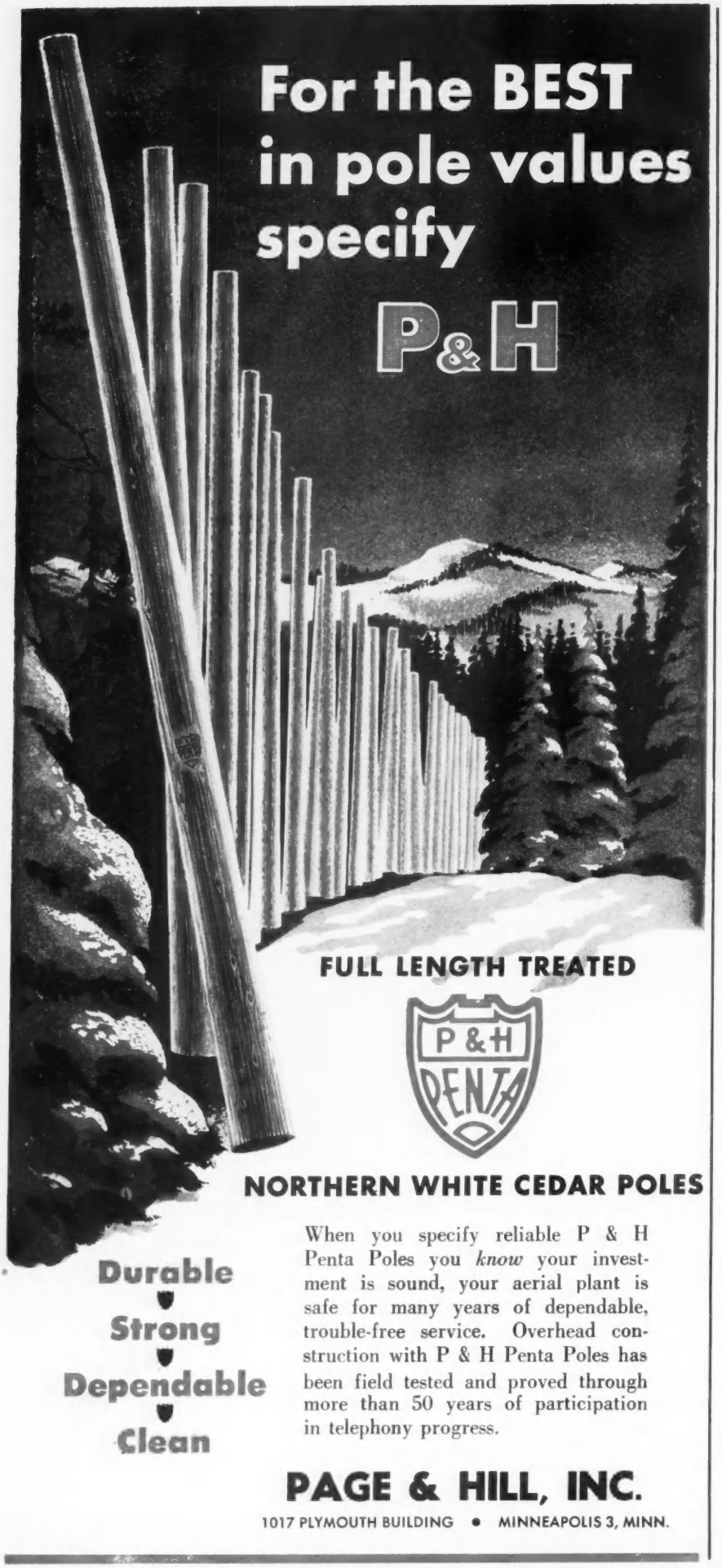
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citizenship is active citizenship. The kind of government we have, both locally and nationally, will always depend upon whether you and I make government our personal concern or decide to leave it to the other fellow.

Work for what you believe is right and don't hesitate to change your mind when you find out that you have been wrong. And may I suggest that you measure your political judgment by the standard of what you think is right for the country, for the whole community rather than what may serve the best advantage of any group. The questions we face nowadays are so big we cannot afford small-minded answers.

A Big View Of The Future

AS WE stride confidently forward to meet the challenges of the Sixties, let us take a big view of the future and not a little one. I say this because a big future can only come from what we have to give it. Some of us can give more than others, it is true, but life is worthy of all that each of us can offer. And the first thing to do is to see life as large, see it as great, see it as limitless in challenge and opportunity.

As we pledge ourselves to become good and worthy citizens, I know that I can pledge to you the continued assistance, counsel and guidance of our Association to help all of us become better telephone people and more competent and better equipped to meet the problems of our industry — problems which are bound to present themselves as the electronic age progresses and as the furnishing of communications services grows more exacting and complex.

Having been privileged this last year to see firsthand how your Association, its officers, its directors and its competent Washington staff function, day in and day out, in the interests of Independent telephony, I can promise you that with your cooperation and God's help, the Association will in the years to come continue as it has in the years before to be the keystone of Independent telelphony — *a part or force upon which associated things can depend.* — *Foster B. McHenry.*

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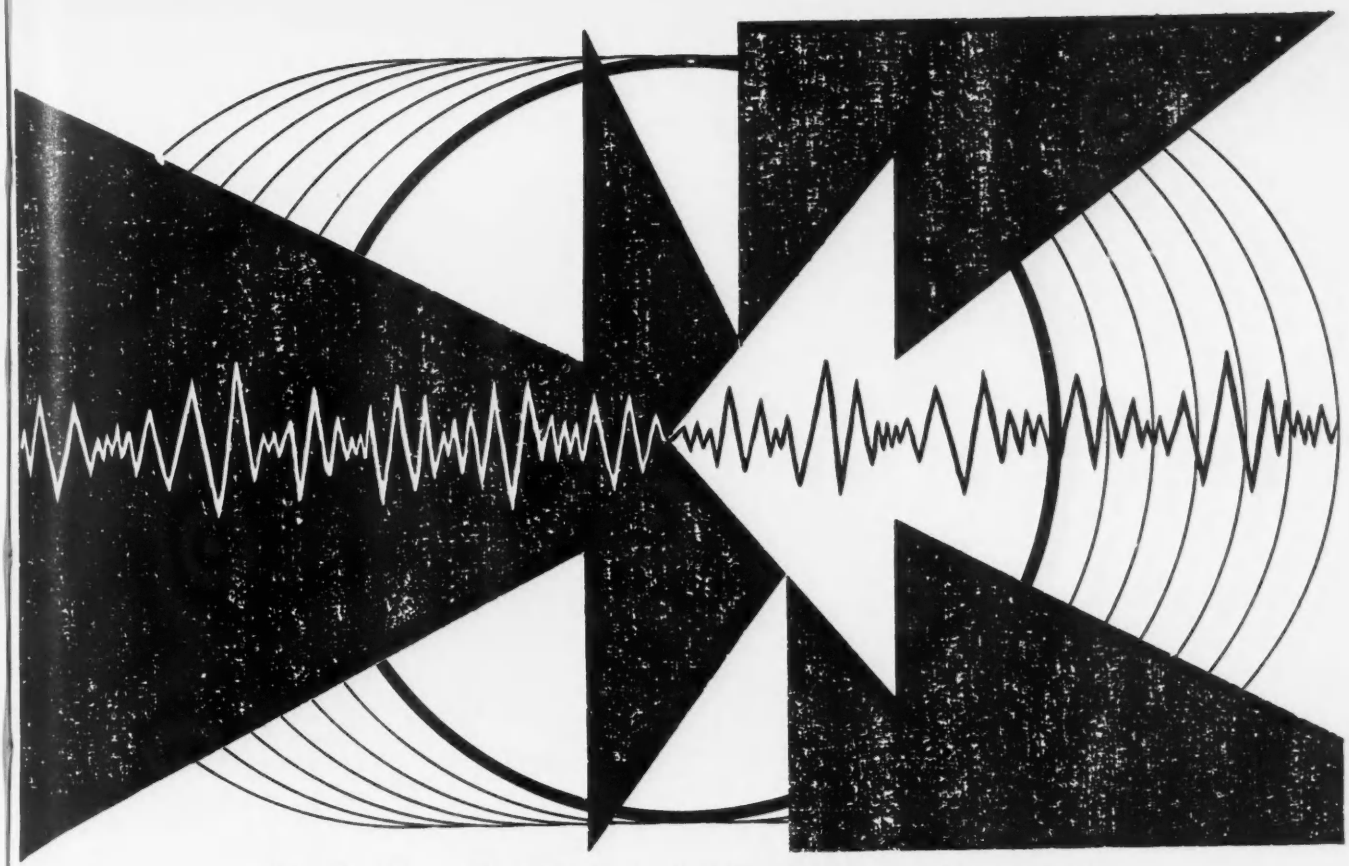

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News and views of Independent telephone people VOLUME 9, NO. 7 • OCTOBER, 1960

1960 — Busiest summer yet for Independents

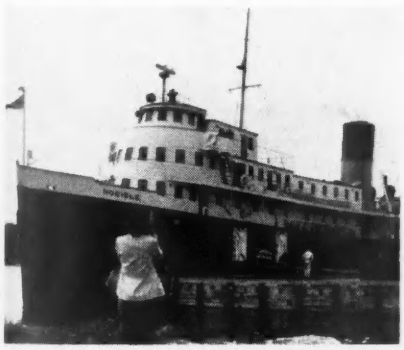
ge Forbes

"Just four states this year," said Mr. Thompson. He turned to the map in his office that marks over 3,000 XY® Dial exchanges now in service or in process—made a circle as shown in the insert at the right.

Then the nights of planning . . . "If we're going to Johnsville, can't we also make a short call at Smithtown?"

"Remember," cautioned the Lady from past experience, "it's not so much the miles as the hours. Wherever we go we always wish we had more time."

Telephone people are deeply involved in the significant changes now taking place in this North Central part of the U. S. and adjacent Canada.



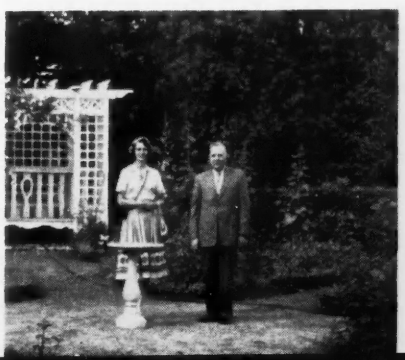
"Take a picture of the car ferry, Lee; I might want to use it." Boat saves 200 miles between Tobermory, Canada, and Manatoulin Island across entrance to Georgian Bay.

A new gadget which adds like an abacus helped compute distance vs. days. The itinerary as finally frozen included 47 customer calls.

In this issue are representative people, places, activities; the first of a continuing series on Telephony in Action.

Independent telephone business is, by and large, closely associated with a family. Mr. and Mrs. Eldon Eckles of Blue Earth, Minn., with daughters Sandra and Gail are representative. Sandra has spent summer as operator; this spring was successful competitor in national prize scholarship. Their son has spent college vacations working for company.

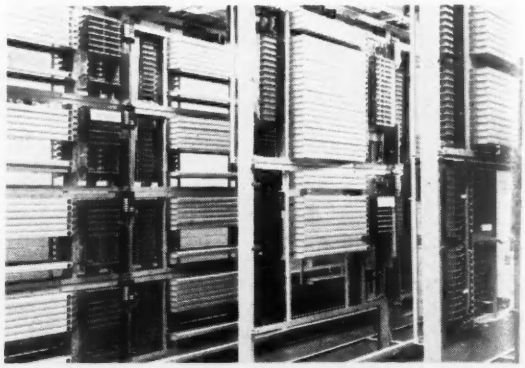
Even in the larger companies, employees are "family." This summer has been one of leave-taking, through retirement or a dial conversion. Mr. Harris Allen, president of the Northwest Telephone Company of Tomah, Wisc., and Mrs. Allen (extreme left) say farewell to two retiring operators — Mrs. Hyland and Miss Kohler—who have a joint service record of 81 years.



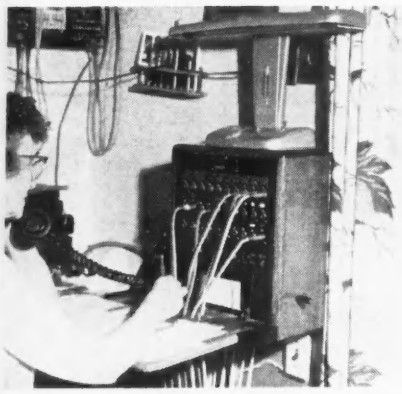
First call was Kincardine, Canada, where Mr. N. T. Jones manages the Bruce Municipal Telephone Co. Here he shows Mrs. Forbes one of the beautiful formal gardens that give town character. At far right is public camp site, Clear Lake, Ia., where your editor enjoyed a favorite pastime.

Visiting editor finds 1960 a banner year for dial conversions and service improvements

The four-state area visited this summer was literally jumping with dial conversions. And there is no question but that the advent of Stromberg-Carlson's "Compak-I" will make a long-desired dial program possible for many smaller companies. In a future issue an example will be cited in some detail of a company of less than 200 stations which will show a neat operating profit *after salaries*, using this equipment as part of a complete modernization package.



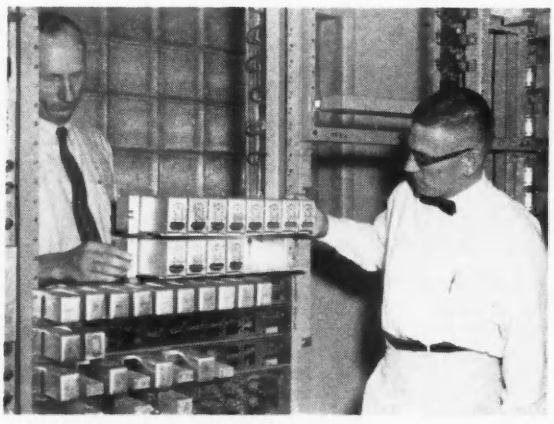
The goal: **Most of the effort in a modernization program comes to a climax when a dial system replaces outmoded equipment. This fine office in Wisconsin is but one of many newly converted exchanges in the four-state area. While the temptation may be to "go fishin'" after cutover, alert managers increase earnings by the extra services possible after the main conversion job.**



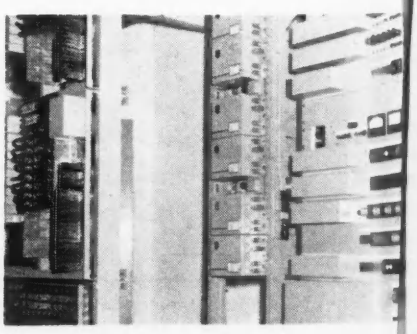
Steps on the way: **The aura of tradition surrounds the helpful, friendly operator (Wallace, Mich.) whose pies burned up in the kitchen while she helped locate Mrs. Jones's freckle-faced boy. Engineers and draftsmen are rushing specifications and plans (Madison, Wisc.), while even the president (right) and manager (left) help pour the dial building floor (Wellman, Iowa).**

It's rare that one finds the so-called "typical" Independent — the old magneto switchboard in the home — but we found one in Wallace, Michigan. Just down the street is the new XY® Dial office, installed and soon to be cut into service. A Stromberg-Carlson loan was the best answer here.

Progress through R.E.A. financing means the selection of an approved engineering firm; typical is the Carl C. Crane organization in Madison, Wisconsin. Improvements through application of carrier and repeaters are showing a sharp increase, yielding better service at lower cost than alternative methods such as rebuilding outside plant.



Service improvements throug better transmission over exis ing facilities. Stromberg-Carlso negative impedance repeate installed at Pequot Lake Minn., will produce saving well above their modest cos Jim Brunes, plant supt. (left and Gilroy Arvig, manager, de cide where to mount packag



Increasing demands for quality toll service can be met quickly and with flexibility through the use of Stromberg-Carlson Carrier. Typical is this 501 installation in West Branch, Iowa, fast-growing suburb of Iowa City.

At the heart of every service improvement or extension is the line crew. At Fennimore, Wisc., they are getting ready for dial in the coming year.

Extensions and PBX services

produce highest revenue per dollar of fixed plant

This summer, more than ever before, a vigorous movement into the merchandising field was obvious. Now that a good proportion of Independents are "over the hump" in their dial conversion program, they are aggressively selling the higher profit items — extensions and the various PBX services.

Our vacation tour began about the time that the first PETITE telephone orders were being shipped. On the first calls we saw the counter cards and stuffers, were asked, "How soon will they come? My customers want them now." Then, as freight caught up with our itinerary, the displays of ready-to-install telephones were continually having to be renewed.

Typical business office scene — *Subscriber*: "When could I have a phone like this?" *Manager*: "Take it home; make sure it's the color you want and see where you want to put it." *Subscriber*: "Yes, I see; this is a *real* telephone. When John sees this in the house, he just *wouldn't dare* say no!"

A PBX system isn't quite the same. The customer doesn't pick it up from your counter and put it in his basket. Yet, strange as it may seem, a few companies still expect the potential user to take the initiative and ask to be served. The manager may not be too happy with his profit and loss sheet; the subscriber is equally un-

Extension telephone sales are outstripping new main stations. When Mrs. Porter, of Eldridge, Iowa, placed one in her home, friends saw, envied, then ordered.

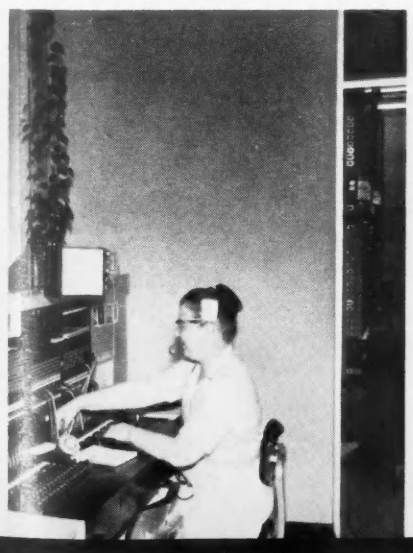
Filmore Melick, of W. Liberty, Iowa, finds that an attractive display draws attention to graceful lines of PETITE telephone. Doris Askam, receiving monthly payment from customer, smiles as she realizes that sale has been just about made.

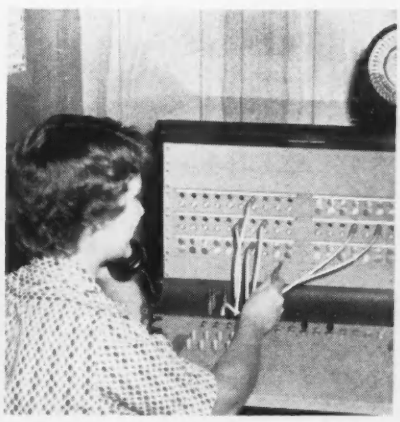
Communications over a well-spread-out factory in Baraga, Mich., were a problem until Ray Stark, telephone manager, suggested a Stromberg-Carlson 6K-1 system.

"These telephones just came in the morning delivery. I've been trying this out myself . . . want to see how it works?" In Kellogg, Iowa, customers are requesting PETITE phones for main stations when magneto phones are being retired.

Perhaps you haven't seen the new bulletins covering key telephones and PBX systems recently made available by Stromberg-Carlson. Written in language your subscriber will understand, this material is available from your nearest Branch or sales representative.

In Newton, Iowa, Mr. L. E. Travis took pride in showing us the fine XY-PBX serving the Maytag Company. For such an organization, the ultimate in PBX equipment is a necessity.

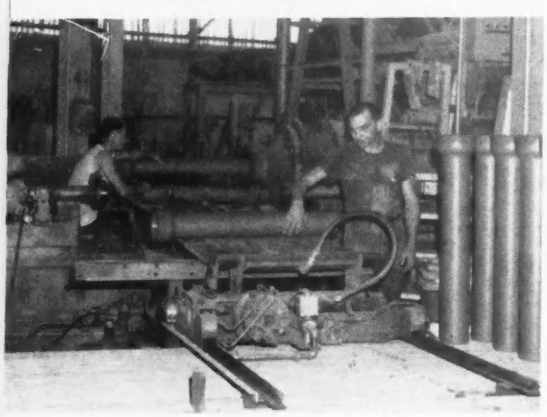




Dial or manual for the medium-size installation? At the Chesaning, Mich., factory of the Heher Mfg. Co., Victor Shapley recommended an F-40A dial system with cordless turret. In the more personalized service of the new Redwood Motel at Jefferson, Iowa, Mr. Daubendiek placed a No. 120 manual board. In both cases, the requirements were carefully studied before the equipment was selected.

Varied faces of the Mid-Continent: how our customers' customers live

Cornbelt Skyscrapers dominated many of the towns visited this summer. From the top of this elevator in Badger, Iowa, the view was limitless — as was the corn stored inside!



How surprising was the valley, at Lehigh, Iowa, where the bottom drops out of an ocean of bean rows, and a mile-square sewer pipe plant gives steady employment to hundreds.

Monroe, Wisconsin, is comfortably diversified, but promotional genius has capitalized on the Swiss ancestry of many of its inhabitants to sell a local product.

happy with his inefficient communications and, quite understandably, thinks that the phone company should come up with a solution. The inherent lack of competition that is basic to the telephone industry is no justification for complacency.

Upgrading PBX service is not only profitable; it cements good public relations between the telephone company and its most influential subscribers. This is why the majority of companies are trying to keep several jumps ahead of a service complaint . . . are making surveys of existing PBX installations to see if greater capacity or a newer type of system should be recommended. These companies recognize that they — not the user — are in the position of qualified expert, and surprisingly enough they are more apt to find sincere appreciation rather than sales resistance *after* a competent survey has been made.

☆ ☆ ☆ ☆ ☆

One of the first questions we ask in going to a new town is, "What do people do here?" Sometimes the answer is obvious . . . when you cross miles of fertile farmland and watch the Cornbelt Skyscrapers leap up before your eyes like a magic beanstalk, you know that corn and beans are grown in overabundance. And you're glad you aren't a politician, charged with producing a solution to this surplus!

But the obvious can be so misleading, as when the regimented rows of soy beans suddenly drop into a hidden valley and there at the bottom is a huge clay pipe plant, pumping industrial dollars into the community's economy.

Michigan's Upper Peninsula, long tied to such diminishing natural resources as iron and lumber, is literally pulling itself up by the bootstraps, as science has developed a method for extracting low-grade ores and new uses for second-growth timber. The Soo Locks are busier than ever, with pay loads carried in *both* directions, many under foreign flag since the opening of the Seaway. The vacation possibilities of this area and the bluewater lake country of Wisconsin, Minnesota and Ontario province are now being fully exploited.

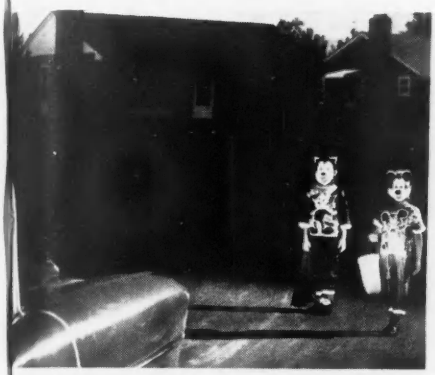
America's Dairyland, with such noted cheese centers as Monroe (Swiss Colony) and Weyauwega (Taylor Maid) is healthy; the turkey farms of southern Minnesota have taken on a new lease of life with frozen ready-to-serve pies. And even the frowning head of state, whose American tour included an Iowa farm, was impressed with the productive capacity of America's heartland. We may boast of our cities, glory in our mountains, display our giant manufacturing centers. But our future strength is also in our good soil, our developing small towns, our decentralized industry . . . in short, in Independentland.

You might even order "blackbirds baked in a pie" from the Tony Downs plant at St. James, Minn. Pizza pies, turkey pies, chocolate pies, chicken pies — and the recipe for amazing sales is toll calls. Sign uses unique method for describing facilities at the many inviting vacation resorts on Manatoulin Island, at north end of Georgian Bay. Many would locate Pickford, Mich., as just south of Sault Ste. Marie, but we preferred to think of visit to Soo Locks as en route to Pickford Telephone Co.

Safety idea can brighten your youngsters' Halloween

Halloween is one night when it's perfectly normal to see ghosts — and much safer, too. A touch of tape or reflective liquid can help your youngsters, dressed as ghosts or goblins, or anything else, have a safe and happy Halloween.

Dark October evenings and dull-black costumes make a dangerous combination for night drivers. But little spooks can romp safely and have more fun with easily applied reflective liquids and tape which make them brightly visible in headlights at night.



Trickin', treatin' and travelin'. Youngsters can walk safely from one "loading station" to another because reflective liquid and tape make costumes clearly visible in headlights of approaching cars.

Any costume can be decorated with these materials, and original costumes can be made easily. Here's how:

A one- or two-piece skeleton suit and a hood or mask can be sewn from inexpensive black muslin. "Bones" then are brushed onto the front or back of the suit with reflective coating readily available at hardware, paint or sporting goods store.

Many costumes are made with designs printed on the fabric; it is easy to apply the coating over these printed patterns.

Similarly, red safety tape, which vividly reflects light, can add a colorful touch to eerie attire. It will stick securely to fabric and may be cut into moons, stars or polka dots, or wound around broomsticks in spirals.

Ready to make the rounds. Brother and sister check their costumes before starting on traditional tour. Tape on cuffs adds a red-orange Halloween touch to the outfits. Masks and emblems have been brushed with reflective liquid.

Kodiak and Sitka Tel award scholarship, promote Alaska growth

Last month was a big one for Tommy Shugak, a June graduate of Kodiak High School in Kodiak, Alaska. He started his college studies at Sheldon Jackson College in Sitka, Alaska.

Tommy is aiming at a career in fisheries and related fields when his training is completed. His education is receiving a boost from a scholarship awarded by the Kodiak and Sitka Telephone Companies.

September was a big month for the owners of these telephone companies, too. John and Martha Cushing received XY® Dial equipment for their Kodiak office. The XY Dial CDO will serve the city of Kodiak and, in a short time, Port Wakefield and Ouzinkie, other villages on Kodiak Island.

This will be the second installation of XY Dial for the Cushing companies. Subscribers at Sitka have been enjoying the benefits of modern dial service since early 1958.

The Cushings have complete faith in the continued growth of Alaska. And they are working hard to supply the quality telephone service that will promote this growth. The result of their effort is evident: a 30% increase in stations in the last year alone.

Sitka, the larger of the two installations, is situated near the Canadian border province of British Columbia. Kodiak is located at roughly the same latitude as Sitka, but 650 air-miles west toward the Alaskan peninsula. Both are among the 10 largest cities in the state of Alaska.

Installer silenced by Thunderbird win

County fair season is finished in many parts of the nation, but old-timers are still complaining that these events just aren't what they used to be. C. A. Ramsey, a Stromberg-Carlson installer from Knoxville, Tenn., agrees with them, but he's in favor of the change.

A white 1960 Ford Thunderbird may have biased his opinion.

Ramsey, working on the Bedford installation of the United Telephone Company of Pa., attended the Bedford County Fair in August. Like most people there, he casually bought a ticket on the grand prize — the Thunderbird. He won the car.

Called upon to say a few words, Ramsey stated that he was very lucky and then drew back from the microphone. It was one of those rare occasions when an installer was practically speechless.

Texas Tel. & Tel. converts three;

Company cuts office where president started career

W. G. Johnson, local district manager for Texas Tel & Tel, presents scissors to Mayor Wiggins at Maypearl exchange ribbon-cutting ceremony. Councilman Lamoine and Mrs. Maxwell, Texas Tel & Tel agent, look on.

Space explorers may be eyeing the planets as possible targets, but W. G. Winters, president of Texas Telephone & Telegraph Co., has done them one better. He launched his telephone career from Venus.

It was at Venus, Texas, that Mr. Winters got his start in the telephone industry. While attending college, he accepted a position as night operator in the Venus office. The recent cut-over to XY® Dial there holds a special significance for him.

The Venus office is one of three new Central Texas XY Dial offices placed in operation by Texas Telephone & Telegraph. Richland and Maypearl, Texas, are now also enjoying this modern dial service. Texas Tel & Tel serves 11,260 subscribers from 49 offices.

Mr. Winters resides in Houston, Texas, and keeps in close contact with current developments in the industry. He is a director of the United States Independent Telephone Association and past president of the Texas Telephone Association.

W. G. Winters, president of Texas Telephone & Telegraph Co., watches with interest as Venus' Mayor Hallmark places first call over new XY Dial system.

The Houston area has benefitted from Mr. Winters' active interest in community projects. Work in the Better Business Bureau, Rotary Club and other civic organizations has always found a place on his busy schedule.

Mr. Winters has the distinction of being listed in the publication *Who's Who in the Southwest*. His memberships include the New York Chamber of Commerce and the American Association of Small Business.

Guided by the leadership of Mr. Winters, Texas Telephone & Telegraph has embarked on an extensive program designed to supply dial service to all its subscribers. In recent months, more than a dozen Texas Tel & Tel offices have been converted to XY Dial.

The accounting department from Corsicana, Texas, company headquarters, was well represented by this attractive group of young Texas ladies.

XY Dial installations match rise in mercury

Climbing dial conversion rates among Independents across the country kept pace with rising temperatures this past summer. Here are a few of the towns now enjoying summer installations of XY Dial.

Lansford, Pennsylvania
Winamac, Indiana
Horton, Kansas
Fredonia, Kansas
Occoquan, Virginia
Irvine, Kentucky
Tulelake, California
Rison, Arkansas
Sparta, North Carolina
Covington, Oklahoma
Sharpsville-Goldsmith, Indiana
Port Byron, New York
Alma, Georgia
Remington, Indiana
Hilton Head, South Carolina
Tarkio, Missouri
McFarland, California
Mill City, Oregon
Solon, Iowa

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GEORGE B. FORBES, Editor
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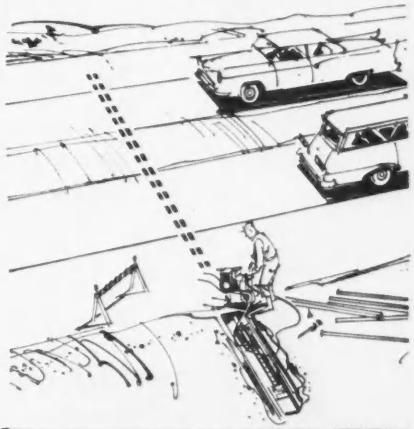
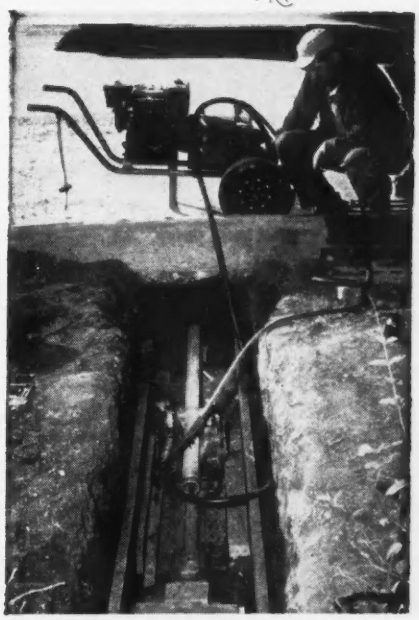
EASY, LOW-COST WAY TO RUN PIPE UNDER STREETS AND WALKS





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THE BACK OF THE BOOK

By JOHN G. REYNOLDS

No Toy

WHEN a Vernon, Texas, subscriber casually mentioned she'd been working on a playhouse for her pre-teen daughters, service rep Mrs. Lavelle Peters took the cue.

It seems the 12 foot by 12 foot playhouse was equipped with its own furniture, television, and cooking facilities — everything but a telephone. Mrs. Peters pointed out that no house, not even a playhouse, was complete without an extension telephone in color.

The woman quickly accepted the suggestion. Now two highly pleased young ladies have an extension, in color.

Something New

TO THE young mind certain sounds are associated with a definite action. Jim McCart, manager at Moberly, Mo., reports that a small girl, picking up the telephone for the first time since the dial conversion there, excitedly ran to her mother when she heard the dial tone.

"Mommy, Mommy," she exclaimed, "the operator's shaving."

"Information Please"

IN TEXAS, the telephone story of the month concerns a Dallas service observer who recorded the following conversation between a customer, speaking in a low voice, and an information operator.

"Percy Allen."

"Who, please?"

"Percy Allen."

"Are you saying Percy Allen?"

"No, ma'm. It's Percy. It's like where you goes to get a job."

"I'm sorry, I don't understand you." Operator gets service assistant.

"May I help you?"

"Yessum, it's Percy Allen."

"Is Allen the last name?"

"No, it's Percy Allen. I can't talk it plain, ma'm. It's where you get a job."

"Is it an employment office?"

"Yes."

"Is Percy the first name?"

"No, ma'm. It's Percy something. I can't talk it plain. It's like you go to Parkland to get a job."

"Oh, you want Parkland Hospital?"

"No, it's St. Paul Hospital in Percy Allen department."

"You want the personnel department at St. Paul Hospital?"

"Yes, that's it. I can't say it."

The operator then gave the customer the main number of the hospital.

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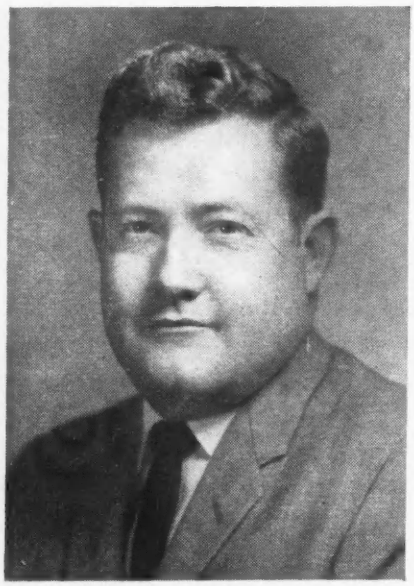

Take a man like
Tom Wells...

Tom is one of our "Revenue Men" in Columbia, Missouri.

A member of the Golden Directory Club for sales achievement, he is representative of the "Revenue Men" who help telephone companies increase revenue from directory sales.

Tom started to work with the General Telephone Directory Company as a sales representative in Fort Wayne, Indiana, in 1957. In 1959 he was promoted to the position of Sales Supervisor and transferred to his current post in Columbia, Missouri.

He and his wife make their home in Columbia now with their son and daughter. A great sports enthusiast, Tom is also an active member of the Knights of Columbus.

Tom Wells is another example of the "Revenue Men" who work for the General Telephone Directory Company and for you. Men who are an asset to any community.

Our Directory "Revenue Men" provide the Independent Telephone Industry with a flexible and highly skilled telephone directory organization. These men—working out of 35 strategic locations—are experienced specialists, trained to give you *complete* and *quality directory service.*

They act as telephone company representatives in their day-to-day contacts with your customers, not only selling and supervising the sale of Yellow Pages advertising—but also acting as public relations representatives for you in their dealings with the public.

Thoroughly trained to know any condition that pertains to telephone service, they're experienced hands at helping large and small Independent Telephone Companies "take the kinks out of knotty directory problems!"

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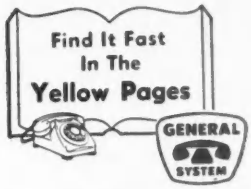

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